

The Income Redistributinal Effects of the Puerto Rican  
Fiscal System

By

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A DISSERTATION PRESENTED TO THE GRADUATE COUNCIL OF  
THE UNIVERSITY OF FLORIDA IN PARTIAL  
FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF  
DOCTOR OF PHILOSOPHY

UNIVERSITY OF FLORIDA  
1971

To Leonora Coralia and Jaelle Natasha

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## ACKNOWLEDGMENTS

Numerous persons have been helpful in the preparation of this dissertation. While conducting research in Puerto Rico the personnel of the Puerto Rican Departments of the Treasury and Labor, the Budget Bureau, the National Accounts Division of the Bureau of Economic and Social Analysis of the Planning Board, and various other governmental agencies and public corporations always proved ready to provide the required data. Particularly singled out in this respect are Mr. Frank Haszard of the Treasury Department and Professors Alfredo González and Edwin Torres of the University of Puerto Rico.

The financial aid that enabled me to begin and complete this study was furnished by a Graduate School Fellowship from the University of Florida and a grant of a year's leave with salary from the University of Puerto Rico at Mayagüez. Finally, much welcome advice and constructive criticism were offered by my supervisory committee chairman, Professor Irving J. Goffman. Gratitude is also extended to the other members of my committee, Professors Ralph H. Blodgett, Lyle N. McAlister, and Dale B. Truett.



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Abstract of Dissertation Presented to the Graduate Council  
of the University of Florida in Partial Fulfillment  
of the Requirements for the Degree of Doctor of Philosophy

THE INCOME REDISTRIBUTIONAL EFFECTS OF THE PUERTO RICAN  
FISCAL SYSTEM

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August, 1971

Chairman: Irving J. Goffman

Major Department: Economics

The purpose of this dissertation is to statistically estimate the income redistributational effects of the fiscal system of the Commonwealth of Puerto Rico in 1963. Tax, public expenditure, and net fiscal incidence by family income class are calculated utilizing a "broad income" base, the latter inclusive of both monetary and non-monetary items. A secondary objective of the analysis is to construct a model upon which later studies of a similar nature may be formulated, for definite public policy implications are implicitly reached in the course of the investigation.

The work is divided into five chapters, with most of the basic data being contained in an appendix. Chapter I establishes the nature and scope of the study, and discusses the multifarious limitations imposed upon the interpretation of this type of inquiry. Chapter II describes and assesses the statistical bases of the estimates. Chapter III

contains a theoretical discussion of the shifting assumptions attached to each type of tax to which Puerto Rican residents are subject (federally levied social insurance contributions and customs duties are included as part of the Commonwealth tax burden). The total tax structure, progressive up to a family broad income level of \$4,000, turns regressive over the \$4,000-\$4,999 family income class, continues its progressivity into the \$5,000-\$7,499 income group, and then again becomes slightly regressive in the open-ended "\$7,500 and over" income bracket.

Chapter IV analyzes, both theoretically and empirically, the incidence of public disbursements classified by functional expenditure category. Federally financed outlays are excluded when feasible (OASDI benefits excepted), since one of the goals of the investigation is to isolate Puerto Rican public policy variables. The complete expenditure structure is found to be regressive over the entire family income range--the effective expenditure rates decline as income rises; that is, such a structure favors low-income families.

Chapter V integrates the results of Chapters III and IV to analyze the net fiscal incidence pattern. The net absolute fiscal distribution is computed by subtracting tax payments from expenditure benefits. The general pattern of

net fiscal incidence is regressive across the overall family income range; family income classes up to \$4,000 realize net benefits, whereas families in the upper income groups experience net losses.

Thus, the main conclusion of the study is that Puerto Rico's fiscal system is so structured, intentionally or not, as to effectuate substantial income redistribution from the higher to the lower family income classes. As a corollary, it is found that the expenditure structure, in contrast to the tax structure, provides the principal thrust toward income redistribution.

## CHAPTER I

### THE NATURE AND LIMITATIONS OF THE STUDY

The purpose of this study is to estimate statistically the income redistributive effects of the fiscal system of the Commonwealth of Puerto Rico.<sup>1</sup> To accomplish this goal both tax and public expenditure incidence are measured and netted out to obtain the redistributive impact of the overall budget structure. No attempt is made at such measurement for each individual Puerto Rican resident; rather, practicality dictates that individuals be grouped by family income. The principal problems to be investigated revolve around the proportions of total income paid in taxes and received in benefits from public expenditures by families in the given income categories. Obviously the results carry policy implications, for if the net fiscal incidence is found to be progressive--favoring the higher income groups--the declared objectives of the Commonwealth government in the socio-economic-political realm are not being fulfilled.<sup>2</sup>

Before embarking on the statistical journey it is

imperative to theoretically clarify the meaning of the concept "net fiscal incidence." Such a concept is easily abused and misused, a matter which emphasizes the need for a lucid theoretical formulation of the problem to be studied.<sup>3</sup>

To understand the term "incidence" picture a society existent without government and introduce into this society a public structure whose sole duty it is to "provide" the pure public good, defense. Such provision requires that the polity acquire resources from the private sector, an acquisition that creates the need to decide which method is to be used to divert resources from private to public use.

No matter which method is applied the procurement and employment of the resources will in one way or another affect society's members. If the problem is merely to conscript and feed an army several alternative courses of action are open: (1) outright confiscation of both men and materiel; (2) the hiring of soldiers and the buying of supplies; (3) a combination of (1) and (2); (4) alternatives are further enlarged if the society is able to hire and purchase externally. In the case of alternatives (2), (3), and (4) it is necessary to fund the transactions by either running the printing presses, floating loans, taxing, or again any combination of the three. It should be evident

that whichever alternative is utilized will have both direct and indirect effects on the society's output level and mix, price structure, income, and asset holdings, and that analysis of all such effects entails a host of difficulties. The interest of this study is on the effects the new budgetary situation has on the "economic position" of each individual component of society when the economic system has completed adjustment to the newly introduced taxes and expenditures; that is, in which way members of society have been financially aided or injured by the innovations.

If the expression "change in economic position" approximates the concept of incidence it becomes essential to give more precision to it. It is possible, for example, to define the individual's economic position as the point at which he is located on his preference scale; thus a "change in economic position" would constitute a movement away from the initial point on the scale. However, the idea of a preference scale is non-operational; that is, it cannot be translated into measurable terms, and it is therefore necessary to fall back on the concept of the individual's wealth position, the latter being defined as the sum of the present values of the stream of income associated with each asset, capitalized at the current rate of interest. Since the introduction of the budget (or a budgetary change) will



affect the economy's price (and interest rate) structure, thereby changing each asset's capitalized income stream, incidence may be defined as the resulting net change in each individual's wealth position (assuming the economy has reached a position of equilibrium).

Even though the concept of wealth position is almost ideal to use in measuring fiscal incidence it too is lacking in operational content due to the dearth of data on individual asset holdings.<sup>4</sup> For this reason recourse is made to net changes in current income to measure fiscal incidence. There are obvious pitfalls in equating wealth and current income for incidence measurement purposes; if, for example, due to one's future income stream pattern, current income is not a good reflection of wealth position then the use of a current income base will produce a variance from the more ideal wealth base. Although such possibilities must be considered, practical necessity requires the use of current income. Thus, the definition of fiscal incidence utilized throughout this analysis is one engendered by the barriers imposed by reality--net fiscal incidence is the final net change in the relative current income position of an individual brought about by public budgetary policy.

#### Choice of Income Concepts

The final choice of an income concept against which

taxes and expenditures are set to measure net fiscal incidence will have a great deal of influence on the degree of progression and/or regression found in the Puerto Rican fiscal structure. There are varied income concepts which might be employed, each of which holds logical validity;<sup>5</sup> the choice, therefore, is not a facile one, but essentially--boils down to opting for a base which includes such non-monetary items as income in kind and imputed interest and rent, or one which excludes all or most non-monetary entries.<sup>6</sup> Since the distribution among income classes of the non-monetary items is not uniform their omission can make the fiscal burden either more progressive or more regressive. If, for example, the value of food produced and consumed on the farm were excluded, the burden would become more regressive since such income in kind is particularly significant for the lower income classes; on the other hand, omission of imputed interest would make the burden appear more progressive. However, it is countered that taxes must be paid monetarily, so that a money income base is most appropriate; moreover, the difficulty of where to draw the line arises if income in kind is counted; for example, should the value of the housewife's work be imputed and added to the non-monetary items? Other problems crop up which are more susceptible to resolution, such as the treat-

ment of retained earnings and the unshifted part of the corporate profits tax. Given these problems two rather similar income bases are employed here, the first labeled "money and imputed income" and the second "broad income"; it is to the latter that most importance is attached.<sup>7</sup>

The decision with respect to the income base reduces to the availability and assumed reliability of the statistical data. Ideally it would have been best to take the component totals of the income bases from the Puerto Rican Department of Labor survey since the principal distributive series utilized in this study originate with the survey.<sup>8</sup> This is not done because of the wide discrepancy between total income (and components) as calculated from the Labor survey and from the national accounts.<sup>9</sup> In a pure value judgment the figures contained in the national income accounts are thought to reflect greater accuracy, so that both of the income concepts approximate the national accounts personal income concept.

Several comments are in order regarding the component items of the two selected bases. Since the national accounts totals are used it is obvious that most capital gains income is excluded from the income bases, although such realized income does form part of the taxable base. Net capital gains income is included in the Labor Department

income base but it is not separable. Due to this exclusion the pattern of tax incidence will appear more progressive than it actually is since it is to be assumed that such income is concentrated in the upper income classes.

The divergence between the money and imputed income base and the broad income base is the result of adjustments made to the former; these additions owe their inclusion to the rationale of the Musgrave-Pechman argument as opposed to the Tucker position.<sup>10</sup> As is posited below the Standard Case assumption is that 40 percent of the corporate income tax remains unshifted; the problem is whether or not the dividend recipient should be charged with the entire 40 percent of the tax or only with that part which is reflected in lower dividend payments. Charging the full 40 percent is consistent with the imputation to the stockholder as profit income of the retained earnings; thus, it is necessary to add to the stockholder's income an amount equal to his retained earnings share plus his portion of the unshifted part of the corporate profits tax. In this manner the entire tax is distributed among family units in their capacities as either consumers or dividend recipients. If the Tucker stand were adopted--that retained earnings and the tax thereon cannot be imputed to stockholders--the implication would be that this portion of the tax is not accounted for

or that it falls on the corporation as an entity apart from its owners. Similar methodological reasoning lies behind the addition of that part of the employer's social insurance contributions which is assumed to be shifted backward to wage earners.

### Limitations of the Analysis

The fact that the results of the study are stated with mathematical precision should not obscure the reality of this type of incidence investigation, the reality being that what appears to be exact is merely an estimate. There exist numerous and admittedly unresolved conceptual and statistical difficulties in attempting to measure tax, expenditure, and net fiscal incidence through the use of effective rates. Some limitations have already appeared; for example, the less than ideal measurement of change in the individual's economic position. Others will become apparent below. A few of the more outstanding ones are discussed at this juncture.

Perhaps the most basic objection is brought to the forefront by Prest.<sup>11</sup> The procedure of adding or subtracting the income changes due to tax changes implies that the original income distribution remains unaltered. Given that tax changes set off a chain reaction of adjustments---throughout the economy such an assumption seems unacceptable;

furthermore, if incidence is estimated in a non-equilibrium situation (that is, one in which adjustments to budgetary changes are still occurring) the certainty of the estimate is called into question. Therefore, incidence should ideally be estimated under conditions approaching full equilibrium. The problem which of course arises is that of identifying a near-equilibrium situation, and is exacerbated by further exogenous changes. It is only practical to take a period of time in which exogenous shocks are not so strong as to overwhelm those effects which are due to budgetary changes. Whether calendar year 1963 in Puerto Rico is such a period is a matter of conjecture. The strength of the Prest objection depends upon the magnitude of the changes; he is willing to accept efforts to measure the incidence of marginal changes of either direct or indirect taxes. Moreover, it is assumed in certain cases below that the general re-adjustments are distributionally neutral. The more valid Prest's critique, the less justified is this latter assumption, but patently it is quite impossible to gauge the logical soundness of such a proposition within the partial equilibrium framework of this analysis.

The statistical sources are open to legitimate doubts. The data used to construct the distributive series are out of necessity based on sample surveys the accuracy of which,

even assuming the sample is statistically valid, is subject to an unknown degree of sampling error. Both tax payments and expenditure benefits are allocated among income classes by means of these series, a procedure which is less precise than actual counting would be; additionally, some of the distributive series are specially constructed for this study on the basis of questionable assumptions and incomplete data (for example, the distribution of farm income). Various totals are distributed by admittedly poor series for the reason that theoretically better series are impossible to construct given the existent data gaps. A conspicuous example of such a gap is the open-endedness of the "\$7,500 and over" family income class which covers 29 percent and 33 percent of family monetary and broad income respectively, although less than 8 percent of the families belong to this bracket. The variations of income within this class are extreme (as can be noted from Treasury data), and yet the distributive series sources force a cutoff at this level. Given the large amount of income lumped together in the highest bracket there exists the distinct possibility that the tax structure and the net fiscal structure are either more progressive or regressive than is revealed, thereby confining the policy implications chiefly to the income groups under \$7,500.

Another limitation has to do with the shifting assumptions posited. As will be pointed out below there seems to be rather widespread consensus regarding the incidence of certain taxes (for example, the personal income tax), whereas the shifting assumptions attached to other taxes evoke endless controversy (for example, the corporate profits tax). The discussion can only be ultimately resolved empirically, but given the present state of economic analysis solution seems distant. For this reason in such instances alternative assumptions are specified. The aforementioned difficulties ring doubly true with respect to expenditures. Expenditure incidence theory has received much less attention than has tax incidence theory, and is relatively underdeveloped. The quandary met quite often in measuring benefits received leads to the use of other approaches to expenditure distribution, and the necessity to allocate general expenditures on a rational basis requires the use of alternative assumptions.

Since the redistributational aspects of the fiscal system are analyzed in terms of family income classes important shifts within each group may not rise to the surface. Expressing the tax burden and the expenditure benefits as a proportion of income in each income bracket yields simply an average burden or benefit, concealing the fact that each



family differs in size, consumption patterns, and other socio-economic characteristics. "Averages of this sort will sometimes give misleading results when the frequency distribution to which they refer is not reasonably symmetrical."<sup>12</sup> To put this another way, the net fiscal incidence on each income class may not affect the component families equally.

The plan of attack is to divide the analysis into three parts. After discussing the statistical bases of the ensuing calculations in Chapter II the incidence of specific taxes and the overall tax structure are estimated in Chapter III. Such estimation involves hypothesizing about the shiftability of each type of levy, and in several cases possible alternative assumptions or points of view are presented, for as will be seen the arithmetical estimations result not from rigid empirical evidence but from the posited assumptions. Little empirical work in an econometric context has been done on tax incidence in the Puerto Rican economy, with the consequence that United States experience is often cited. Chapter IV then steps into the even less accurate world of expenditure incidence, a field where relatively little has been done, both theoretically and empirically, in contrast to the tax side of the equation. The pitfalls involved in expenditure incidence estimation will become clearly evident, and one can admittedly question the

validity of making such an attempt. Nevertheless, it is felt that it must be undertaken. An idea of the direction the distributional effects public outlays take is better than none at all. Furthermore, the stated objective of the study is to estimate the redistributive effects of the fiscal system, and without analysis of the expenditure side of the budgetary process this goal is transparently unattainable. Finally, both chapters are brought together in Chapter V in order to estimate the net fiscal incidence of the Puerto Rican fiscal system.

A word about the particular political relationship between the United States and Puerto Rico ought to be inserted at this point, but only to the extent that it influences the analysis. English language references to the island's political status generally utilize the term Commonwealth of Puerto Rico, a notation which may mislead if it raises connotations of the British Commonwealth. A more descriptive title is that which translates the Spanish language term Estado Libre Asociado--Freely Associated State. Semantics are disregarded and the term Commonwealth is used throughout the study despite its rather ambiguous meaning.

Under Commonwealth status Puerto Rico is fiscally autonomous. It falls within United States tariff walls but is basically free to tax and spend as it pleases. Residents

of Puerto Rico pay only insular taxes, with the exception of federal social insurance contributions. Thus, the island determines its own tax policy variables with the aforementioned omission. On the expenditure side Puerto Rico receives grants directly from federal government agencies in the same manner the federated states of the American union do, although not always in the same amount. Additionally, "off-shore excises"--principally on rum--are returned to the Commonwealth treasury, federal agencies make operational disbursements on the island, and individual income is supplemented by federal transfers. In an attempt to isolate the redistributational aspects of the Puerto Rican fiscal system those variables which do not come under direct Commonwealth control are eliminated, or the data are presented in such a manner that they may be omitted. Thus, on the tax side federal social security contributions are presented in each table so that they may be either included in or excluded from the computations. On the expenditure side federal grants and agency disbursements are totally excluded, while the tabular presentation permits exclusion or inclusion of OASDI benefits.

## NOTES

1. Use of the term fiscal or budgetary system will throughout this study refer to the Puerto Rican public sector. In other words, interest lies in the effects on income redistribution of both tax and expenditure policies. Similar analyses have been carried out for other countries. See, for example, Tibor Barna, Redistribution of Incomes Through Public Finance in 1937 (London: Oxford University Press, 1945); Allan M. Cartter, The Redistribution of Income in Postwar Britain (New Haven: Yale University Press, 1955); John H. Adler and Eugene R. Schlesinger, "The Fiscal System, the Distribution of Income, and Public Welfare," in Kenyon E. Poole (ed.), Fiscal Policies and the American Economy (New York: Prentice-Hall, 1951), pp. 359-421; O. H. Brownlee, Estimated Distribution of Minnesota Taxes and Public Expenditure Benefits (Minneapolis: University of Minnesota Press, 1960); W. Irwin Gillespie, "Effect of Public Expenditures on the Distribution of Income," in R. A. Musgrave (ed.), Essays in Fiscal Federalism (Washington: The Brookings Institution, 1965), pp. 122-186 and hereafter referred to as Gillespie (U.S.); W. Irwin Gillespie, The Incidence of Taxes and Public Expenditures in the Canadian Economy, Study No. 2 of the Royal Commission on Taxation (Ottawa: Queen's Printer, 1966) and hereafter referred to as Gillespie (Canada); one such study has been done on Puerto Rico--Mohinder S. Bhatia, Redistribution of Income Through the Fiscal System of Puerto Rico, 1958 (San Juan: Planning Board, 1960). The Bhatia study suffers from some severe limitations. It assumes, but for one insignificant exception, a closed economy. Its theoretical framework is questionable and it does not provide a comprehensive analysis of benefit expenditure incidence; its use as a reference source is negligible.

2. Since the terms "progressive" or "regressive" are more commonly applied to the tax side of the budget, care should be used when dealing with the net fiscal concept. A progressive tax or expenditure schedule is one in which the effective tax or expenditure rate rises as income rises;

vice versa, regressive schedules find the effective rates declining as income rises. The net fiscal schedule is calculated by subtracting the tax schedule from the expenditure schedule, so that if the effective net fiscal rate is positive but declines as income rises the budgetary schedule is labeled regressive; it is, however, favorable to the lower income classes. On the other hand, if the net fiscal rate is positive and rises as income increases the budgetary schedule is seen as progressive; nevertheless, it is favorable to the higher income classes. Put another way, a progressive net fiscal schedule is pro-rich whereas a regressive net fiscal schedule is pro-poor. As a declared example of these objectives refer to Constitutional Convention of Puerto Rico, Constitution of the Commonwealth of Puerto Rico (San Juan: Department of Finance, 1952), Article II, Section 20. A definitely positive role for the public sector is here envisioned. " . . . the people and the government of Puerto Rico shall do everything in their power to promote the greatest possible expansion of the system of production, to assure the fairest distribution of economic output, and to obtain the maximum understanding between individual initiative and collective cooperation. The executive and judicial branches shall bear in mind this duty and shall construe the laws that tend to fulfill it in the most favorable manner possible."

3. The following discussion is based upon Peter Newman's, An Empirical Study of the Distribution of the Tax Burden in the United States, 1955-1959, unpublished paper done at the University of Michigan, Ann Arbor, dated September, 1961; and Richard A. Musgrave's, The Theory of Public Finance (New York: McGraw-Hill, 1959), pp. 205-231.

4. The Bureau of Economic and Financial Studies of the Puerto Rican Treasury Department has done some work in estimating wealth concentration in Puerto Rico in the 1960s. The procedures and results remain strictly confidential, however.

5. For examples of different income bases see R. A. Musgrave, J. J. Carroll, L. D. Cook, and L. Frane, "Distribution of Tax Payments by Income Groups: A Case Study for 1948," National Tax Journal, Vol. IV (March, 1951), pp. 1-53, hereafter referred to as Musgrave-1948; Newman; Adler and Schlesinger; two especially dissimilar bases merit additional comment. George Bishop argues that net national product is the ideal base, and proceeds to measure the tax burden against such a base. What this procedure essentially involves is the addition to personal income of all indirect

business taxes and corporate income taxes. If this is done then the overall tax distribution would, given a progressive tax structure, become more progressive. Musgrave points out that this methodology involves a serious error [Richard A. Musgrave, "Cálculo de la distribución de la carga tributaria," Pan American Union, Reforma tributaria para América Latina (Washington: 1963), pp. 43-44, hereafter referred to as Musgrave-Reforma tributaria]. In comparing the aggregate tax burdens in two countries it is true that it makes no difference whether the taxes are direct or indirect. It does not follow, however, that such a distinction is of no import for comparisons among income classes in one country. If the corporate profits tax were repealed, shareholder's income would rise through either greater dividend payments and/or retained earnings. However, if a general sales tax were repealed all families would not benefit since it does not form part of their pre-tax income. For Bishop's contributions see "The Tax Burden by Income Class, 1958," National Tax Journal, Vol. XIV (March, 1961), pp. 41-58. See also two Tax Foundation, Inc., studies in which Bishop appears to be the principal researcher: The Tax Burden in Relation to National Income and Product, Research Aid No. 4 (New York: 1957); and Tax Burdens and Benefits of Government Expenditures by Income Class, 1961 and 1965 (New York: 1967). Gillespie, in both his U.S. and Canadian studies, defines "broad" income in more or less the same manner as does this study (but includes capital gains income in the U.S. study) with the exception that he subtracts government transfer payments in the pursuit of consistency; that is, "either the income base must exclude the entire public sector, or it must include the entire public sector within its distribution; and all government expenditures--expenditures on goods and services and transfer payments to families--must be treated identically in the income base." [Gillespie (Canada), p. 9]. As Gillespie opines the "broad" income definition of this study is not wholly satisfactory for a fiscal incidence analysis because it excludes the benefits from public expenditures on goods and services but includes an amount used to pay taxes. But it is precisely for this reason that public transfer payments are included here in the income base, for their inclusion corresponds more to the national accounts concept of personal income. Certainly the theoretical validity of Gillespie's point is not to be denied, but it is also felt logical to proceed along the lines defined in this analysis.

6. See the Musgrave-Tucker debate: Musgrave-1948; R. A. Musgrave and L. Frane, "Rejoinder to Dr. Tucker," National

Tax Journal, Vol. V (March, 1952), pp. 15-35; R. A. Musgrave and L. Frane, "Concluding Note," National Tax Journal, Vol. V (March, 1952), p. 39; Rufus S. Tucker, "Distribution of Tax Burdens in 1948," National Tax Journal, Vol. IV (September, 1951), pp. 269-285; Rufus S. Tucker, "Rebuttal," National Tax Journal, Vol. V (March, 1952), pp. 36-38.

7. See Table A-2 for a complete explanation of both concepts.

8. The following volumes of the income and expenditure survey carried out in 1964 by the Puerto Rican Department of Labor are used in this study. Future references to the survey will be designated only by the volume number (for example, Report 2): Department of Labor of Puerto Rico, Bureau of Labor Statistics, Special Economic Studies Division, Income and Expenditures of the Families, Puerto Rico, 1963, Report 1-A, Income of All Families (San Juan: February, 1967); Report 1-C, Income of Non-Wage Earners' Families (San Juan: March, 1967); Report 2, Family Income by Source of Income (San Juan: June, 1967); Report 3, Housing Conditions (San Juan: August, 1967); Report 4-A, Expenditures of All Families (San Juan: November, 1967).

9. See pages 19-26 for a deeper discussion of the discrepancy.

10. See the cited sources in note 6 above in addition to R. S. Tucker, "Distribution of Tax Burdens in 1948," Proceedings of the Forty-Fifth Annual Conference on Taxation (Sacramento: National Tax Association, 1953), pp. 195-203; R. A. Musgrave, "Distribution of Tax Payments by Income Groups; A Review," Proceedings of the Forty-Fifth Annual Conference on Taxation (Sacramento: National Tax Association, 1953), pp. 169-195; Joseph A. Pechman, "Some Technical Problems in the Measurement of Tax Burdens," Proceedings of the Forty-Fifth Annual Conference on Taxation (Sacramento: National Tax Association, 1953), pp. 204-213.

11. A. R. Prest, "Statistical Calculations of the Tax Burden," Economica, Vol. XXII (August, 1955), pp. 234-245.

12. Gerhard Colm and Haskell P. Wald, "Some Comments on Tax Burden Comparisons," National Tax Journal, Vol. V (March, 1952), p. 9. For further discussion of this point and others see the entire cited source, pp. 1-14.

## CHAPTER II

### THE STATISTICAL BASES OF THE STUDY

A fiscal incidence analysis requires two basic data series, a distribution of income by income classes and the pattern of consumption expenditure in each of these classes. Ideally both series should be derived from the same sample survey, but for reasons explained below such a procedure is not thought feasible in this case.

#### The Income Distribution

In the previous chapter certain theoretical problems dealing with the income base were discussed, and it was stated that two distinctive bases are to be used--money and imputed income and broad income. Furthermore, a decision was made to abandon the income distribution derived from the Puerto Rican Department of Labor survey (which serves as the foundation for the consumer spending series) in favor of the construction of an income base grounded upon national income accounts aggregates. To understand the rationale behind this the Labor Department survey is first discussed.

Report 1-A of the survey defines income in money terms



alone; included in money income are wages and salaries (less occupational expenses), net income from unincorporated businesses, professions, or trades, net income from rented property, receipts from roomers and boarders, interest (excluding accrued interest), dividends, net capital gains, social security and pension receipts, alimony, gifts, inheritances, and net gambling gains.<sup>1</sup> Given the nature of such a survey one would expect considerable under-reporting of many of these items no matter what precautions taken, allowances made, or cross-checking done. Line 1 of Table 1 gives the total family money income distribution taken from the survey data; line 2 gives the money income distribution for individuals. In order to approximate the desired theoretical income concept income in kind and imputed interest and rent are added to monetary income (Lines 3, 4, and 5). Income in kind is estimated in Report 2 and is an extremely inclusive concept, embracing all families and a variety of components--food, housing, clothing, medical care, transportation, personal care articles and services, and recreational services. Net imputed interest and gross imputed rent totals are not given in the Labor survey but are obtained from the National Accounts Bureau of the Puerto Rican Planning Board. The sum of the five items appears to be a decent approximation to the personal income concept of

TABLE 1

TOTAL AMOUNT OF TYPES OF INCOME BY INCOME CLASS, 1963  
(millions of dollars)

Line	Type of Income	Less than							Total <sup>a</sup>
		\$1,000	1,999	2,999	3,999	\$4,000-	\$5,000-	\$7,500 and over	
1.	Family Income	51.3	181.1	239.9	175.0	158.4	264.0	439.1	1,508.9
2.	Individual Income	12.0	10.3	6.2	6.5	6.0	4.7	10.9	56.4
3.	Family Income in Kind	27.2	41.7	28.5	13.0	9.6	13.6	9.5	142.9
4.	Net Imputed Interest	0	0.2	0.6	1.5	2.0	4.4	8.3	17.0
5.	Gross Imputed Rent	0.5	2.4	5.6	8.4	8.5	20.1	81.2	126.7
6.	Total	91.0	235.7	280.8	204.4	184.5	306.8	549.0	1,851.9
7.	Percentage Distribution	4.9	12.7	15.2	11.0	10.0	16.6	29.6	100.0

<sup>a</sup>Details may not sum to totals due to rounding.

Sources:

Line 1 - Department of Labor of Puerto Rico, Income and Expenditures of the Families, Puerto Rico, 1963, Report 1-A, Income of All Families (San Juan: February, 1967), p. 6. The source gives a percentage distribution and an average income figure for all families, so that total income of \$1,508.9 is calculated by multiplying the average by the total number of families; the absolute amount of income in each bracket is then obtained by using the percentages against total income.

Line 2 - Department of Labor of Puerto Rico, Income and Expenditures of the Families, Puerto Rico, 1963, Report 1-C, Income of Non-Wage Earners' Families (San Juan: March, 1967), p. 57. The data are presented and the allocations among income classes are made in the same manner as Line 1. The highest income class in the source is "\$5,000 and over," leading to the completely arbitrary assumption that 30 percent of the income in this group lies in the \$5,000-\$7,499 range.

Line 3 - Department of Labor of Puerto Rico, Income and Expenditures of the Families, Puerto Rico, 1963, Report 2, Family Income by Source of Income (San Juan: June, 1967), p. 51. An average income in kind figure is given for each income class; the average is multiplied by the number of families in each class to arrive at each total. For the complete definition of family income in kind refer to pages 52-53. Total income in kind amounts to \$142.9 million in this source, and is \$78 million as calculated from national accounts data. At the time this problem was researched the National Accounts Bureau did not have an estimate of this figure on its work sheets, the latest published figure available being for fiscal 1958. By taking the average of income in kind for the period 1956-1958 as a percentage of average national income over the same time span and applying the resultant proportion to calendar 1963 national income the income in kind estimate of \$78 million is calculated. The apparently wide divergence between the Labor total and the national accounts total may be largely accounted for by the fact that the former total is much more inclusive; that is, it includes the value of food produced and consumed by all families as well as other forms of income in kind (clothing, medical services), whereas the latter comprises only salaries and wages in kind and the value of food produced and consumed on the farm.

Line 4 - Total net imputed interest is calculated from the national accounts by taking imputed interest for private businesses and households as a proportion of national income for the latest three published years (1956-1958) and applying the resultant percentage against 1963 national income; the total is then distributed according to interest paid on taxpayer's personal indebtedness, an extremely poor series but the best one known available (see Table A-1, Line 13). The published source for the years

TABLE 1 completed

Line 4 - 1956-58 is Junta de Planificación, Negociado de Planificación Económica y (cont.) Social, Ingreso y Producto, Puerto Rico, 1940, 1947-1960 (San Juan), p. A-235.

Line 5 - Total gross imputed rent is taken from National Accounts Bureau work sheets and is distributed according to the series "taxes paid on residential property" (see Table A-1, Line 12). No breakdown is available for net imputed rent so that this item is overstated as compared to the net definition used in U.S. national accounts imputations.

Line 6 - Sum of Lines 1-5.

Line 7 - Percentage distribution of Line 6.

social accounting statistics. Nonetheless the total (Line 6) falls quite a bit short of the personal income total in the national accounts despite the fact that many items of monetary income--net capital gains, inheritances, gifts--are not included in the definition of personal income, and that the survey defines family income in kind in a much broader sense than do the social accounts. Although it is duly recognized that under-reporting may be the major causal factor in the discrepancy, and although such under-reporting may be distributionally neutral, recourse is had to the national income accounts totals. From these totals what is thought to be a more meaningful income base more consistent with national accounts figures is constructed. As previously stated this policy is founded not only on skepticism concerning the Labor survey but partially implies a judgment--trained economists have developed the Puerto Rican national accounts estimates to a level of reliability perhaps comparable with those of the most developed nations.

The money and imputed income concept of Table 2 is considered a good approximation to the personal income concept of the national accounts. The totals of all the items are derived from national accounts sources and are distributed by series constructed from both the Labor survey and Treasury Department work sheets. This overlapping of two or more

TABLE 2

## THE BASIC INCOME DISTRIBUTIONS BY INCOME CLASS, 1963

Family Money Income Class <sup>c</sup>	Money and Imputed Income (millions of dollars)	Percentage Distribution <sup>b</sup>	Broad Income (millions of dollars)	Percentage Distribution <sup>b</sup>
Less than \$1,000	74	3.7	76	3.4
\$1,000-\$1,999	246	12.2	258	11.7
\$2,000-\$2,999	310	15.4	327	14.8
\$3,000-\$3,999	224	11.1	239	10.8
\$4,000-\$4,999	203	10.1	215	9.8
\$5,000-\$7,499	340	16.9	359	16.3
\$7,500 and over	622	30.8	737	33.4
Total <sup>a</sup>	2,017	100.0	2,209	100.0

<sup>a</sup>Details may not sum to totals due to rounding.

<sup>b</sup>The percentage distributions are calculated from the data presented in Table A-2 and not from the above rounded figures.

<sup>c</sup>The income classes (brackets, groups) are referred to here and in subsequent tables as family money income classes because the series used to distribute most income components are derived from the Labor Department survey, which employs a family monetary income base. However, the income within the family money income classes is either money and imputed income or broad income, both of which are inclusive of families and unattached individuals.

Source: Table A-2, Lines 1 and 8.

sources is brought about by the decision to reject the Labor survey income base, and certainly might affect the reliability of the allocations among income classes; nevertheless the import of such a distortion is not believed to be of excess magnitude and may be compensated for by the use of the "better" income base. The money and imputed income base comprises wage and salary income plus supplements and income in kind, investment income (net rental income inclusive of imputed rent, interest income inclusive of net imputed interest, and dividend receipts of residents), transfer payments from both the United States and Puerto Rican governments, from businesses, and from the rest of the world, and food produced and consumed by the families.

The more comprehensive broad income base is derived from money and imputed income by the addition of three non-monetary items whose inclusion appears theoretically justifiable in that they do improve the family's "economic position," albeit in an accrued sense. Retained earnings imputed to or accruing to residents is the first and easiest of these items to visualize; the total of \$101.2 million is distributed according to a distribution of dividends received. As will be noted in Chapter III the Standard Case assumption regarding the shifting of the corporate income tax is that 40 percent is absorbed by shareholders, 10 per-

cent is shifted backward, and 50 percent is shifted forward; whereas the 40 percent and 10 percent must be considered part of each stockholder's and wage-earner's tax burden respectively they also form part of their incomes. Both parties experience a reduction in their before-tax incomes due to the tax, a reduction returned to them by means of this imputation. A similar rationale is applied in the case of the backward shifted portion of social insurance contributions; once again that part of such contributions which is assumed to be borne by the employee forms part of his pre-tax income and is therefore added to his income base.

Note is taken of the fact that aggregate money and imputed income reaches a value of \$2,016.6 million, a reflection of an apparent "overshot" of the total it should approximate, that of total personal income from the national accounts data (\$1,993.3 million). An analytical--but not empirical--reconciliation may account for the discrepancy if it is observed that business transfer payments (bad debts and donations to non-profit institutions) are included in money and imputed income but not in personal income; in addition, both imputed interest and rent are this study's own estimates (see Table 1). Transfers from the rest of the world, in the majority remittances from Puerto Ricans residing in the United States, are included in the personal



income concept in Puerto Rican social accounts, a divergence from U.S. practice.

### Distribution of Families

The income concepts, as well as all series found in this investigation, are distributed by family income groups. It is assumed that the family is the taxpaying unit and the unit which benefits from public expenditures, and it is precisely this assumption which may introduce an unknown amount of error. The problem arises because the family distribution employed here is contained in the Labor survey even though it does not account for the total Puerto Rican population. Estimated population figures put the number of island residents at 2,528,000 as of July 1, 1963;<sup>2</sup> the Labor survey covers 461,000 families with an average family size of 5.1 persons, or a total of 2,351,100.<sup>3</sup> Additional but limited coverage extends to 39,000 individuals, but no distributive income or consumption series beyond that of the survey's basic income concept are undertaken.<sup>4</sup> Due to this limitation these individuals must be ignored except to implicitly assume that they have the same income and expenditure patterns as do families, for both the money and imputed income and broad income bases include unattached individuals.

Several reasons might be posited for the existence of the gap. The Labor sample universe does not include

military personnel living on bases on Puerto Rican soil, transients, and the institutional population. Moreover, only "full year families"--those families which constitute a consumer unit during the entire year--are counted in the survey. A high degree of population mobility, especially between the island and the mainland, might alone account for the gap, since individuals "in transit" would not have been considered as part of "full year families." But no matter the reasons for the non-coverage of the total estimated population this study must necessarily proceed under the assumption that the income sources and expenditures of the uncovered population are distributionally neutral. Thus, the following family distribution series may represent a mere approximation to the "true" distribution (see Table 3).

The Ratio of Non-Resident Investment to  
Total Investment

One of the principal figures used throughout the study to calculate exported tax portions is the percentage obtained by dividing the value of non-resident investment in 1963 by the value of total investment. Only the numerator value is found among published statistics (to this writer's knowledge) so that it becomes necessary to devise a method for calculation of the denominator.<sup>6</sup> An incremental capital-output ratio is computed for each of the fiscal years 1948-1964 and the average is then taken; the average

TABLE 3

## DISTRIBUTION OF FAMILIES AND FAMILY INCOME BY INCOME CLASS, 1963

<u>Family Money Income Class</u>	<u>(1) Number of Families<sup>a</sup></u>	<u>(2) Percentage Distribution</u>	<u>(3) Monetary Income<sup>b</sup></u>	<u>(4) Percentage Distribution</u>	<u>(5) Broad Income<sup>c</sup></u>	<u>(6) Percentage Distribution</u>
Less than \$1,000	102,000	20.4	63.3	4.0	76.2	3.4
\$1,000-\$1,999	128,000	25.6	191.4	12.2	257.6	11.7
\$2,000-\$2,999	100,000	20.0	246.1	15.7	326.6	14.8
\$3,000-\$3,999	53,000	10.6	181.5	11.6	238.5	10.8
\$4,000-\$4,999	36,000	7.2	164.4	10.5	215.5	9.8
\$5,000-\$7,499	45,000	9.0	268.7	17.2	359.3	16.3
<u>\$7,500 and over</u>	<u>36,000</u>	<u>7.2</u>	<u>450.0</u>	<u>28.7</u>	<u>737.3</u>	<u>33.4</u>
Total <sup>d</sup>	500,000	100.0	1,565.4	100.0	2,209.2	100.0

<sup>a</sup>The number of families includes both families and unattached individuals (461,000 and 39,000 respectively). The Labor survey defines families and individuals as consumer families and consumer individuals; the former is "a group of persons dependent on a common or pooled income for the major items of expense and usually living in the same household"; the latter is "a person financially independent of any family group, living alone or in a household with others." The term "consumer unit" applies to both. Numbers are rounded to sum to the exact total.

<sup>b</sup>Monetary income is that of the Labor survey; it does not include income in kind and is the sum of family and individual income. The purpose of its inclusion in this table is to permit one to compare its distribution with that of broad income.

<sup>c</sup>Broad income is defined in Table A-2.

<sup>d</sup>Details may not sum to totals due to rounding.

Sources:

- Column (1) - Rounded sum of the data found in Tables A-13 and A-14.
- Column (2) - Percentage distribution of Column (1).
- Column (3) - Sum of data on families from Department of Labor of Puerto Rico, Income and Expenditures of the Families, Puerto Rico, 1963, Report 1-A, Income of All Families (San Juan: February, 1967), p. 6; and data on unattached individuals from Report 1-C, Income of Non-Wage Earners' Families (San Juan: March, 1967), p. 57.
- Column (4) - Percentage distribution of Column (3).
- Columns (5) and (6) - Table A-2.

(2.32) is assumed to represent the capital-output ratio existent in the Puerto Rican economy in calendar year 1963, and is therefore multiplied by calendar year 1963 gross national product to obtain the estimated value of total investment in Puerto Rico for the given year. The value of non-resident investment being \$2.4 billion and that of total investment being \$5.5 billion the resulting percentage is 0.44. Table 4 shows the data utilized in making the computations.

The computation of total investment through use of an average of a series of incremental capital-output ratios (ICOR) is open to a number of limitations relating basically to the derivation and utilization of capital-output ratios themselves. First, the output and investment figures employed here are those for gross fixed investment and gross output; obviously, if other combinations such as net output, gross investment, net investment, or net fixed investment were used the value of the ICOR series would be different. Kindleberger states that if transformations in the capital structure of the economy are frequent then the gross concepts are the relevant ones, because with stability depreciation allowances are not needed to shift capital to other sectors.<sup>7</sup> Over the period covered by the ICOR series the Puerto Rican economy underwent vast structural changes,

TABLE 4  
INCREMENTAL CAPITAL-OUTPUT RATIOS, 1947-1964  
(millions of current dollars)

Fiscal Year	Gross National Product (Y)	$\Delta Y$	Gross Fixed Domestic Investment (I)	Capital- Output Ratio
1947	612	-	62	-
1948	651	39	101	1.59
1949	719	68	116	1.49
1950	755	36	111	3.22
1951	815	60	125	1.85
1952	968	153	151	0.82
1953	1,048	80	159	1.89
1954	1,104	56	173	2.84
1955	1,142	38	203	4.55
1956	1,199	57	217	3.56
1957	1,271	72	260	3.01
1958	1,387	116	280	2.24
1959	1,533	146	300	1.92
1960	1,681	148	355	2.03
1961	1,832	151	378	2.35
1962	2,036	204	448	1.85
1963	2,257	221	489	2.03
1964	2,475	218	584	2.24

<sup>a</sup>The formula used to compute the marginal capital-output ratios is  $\frac{I_{t-1}}{\Delta Y}$ ; that is, a one-year lag or gestation period is assumed for investment projects.

Source: Years 1947-1959 from Junta de Planificación, Negociado de Análisis Económico y Social, División de Cuentas Sociales, Ingreso y Producto, Puerto Rico, 1965 (San Juan: 1966), pp. 8-11; years 1960-1964 from Junta de Planificación, Negociado de Análisis Económico y Social, Ingreso y Producto, Puerto Rico, 1969, pp. 1, 4.

thereby justifying the gross computational base. Second, there is a drastic oversimplification involved in the assumption of a one-year gestation period for all new investment projects, which in reality come to fruition over varying time spans, not in the fixed span of one year.

Third, the assumption implicitly made is that output (GNP) is a linear function of capital alone, but clearly other factors of production influence output.<sup>8</sup> The ICOR is a full derivative, the supply of all factors other than capital being variable; that is, increased output is determined not only by increased capital stock but by additions of other factors. "Only if it is assumed that the supply of these other factors is infinitely elastic, is the increase in output determined solely by the amount of additional capital."<sup>9</sup> Certainly it is not tenable in the Puerto Rican case to make a mutatis mutandis assumption of this nature. Fourth, a global ICOR and average capital-output ratio are posited; however, these ratios in reality depend on the ratios in the various sectors of the economy, changes in the latter affecting the former. Ideally capital-output ratios should be computed at the sectoral level.

Despite these limitations recourse is had to the above-described method of computing the value of total Commonwealth investment. As Kindleberger observes, "over long

periods of time, averaging the annual marginal rate appears to produce meaningful overall results. This is in large part . . . the result of the law of large numbers in which opposing movements cancel out."<sup>10</sup>

#### Distribution of Consumer Expenditures

To distribute both specific tax and expenditure totals by income class a pattern of consumer spending by income group is another required statistical base. Report 4-A of the Labor survey provides the necessary data, but its coverage is limited to family units only; that is, no information is furnished regarding the consumption habits of unattached individuals.<sup>11</sup> This exclusion most likely leads to an indeterminate alteration of the many expenditure distributive series from the "true" distribution, for there is reason to suspect that the consumptive patterns of the 39,000 unattached individuals covered by the sample survey differ from those of the 461,000 families. For example, 63.3 percent of the individuals fall in the lowest income bracket, whereas only 16.7 percent of families do so; 40 percent are over 64 years of age, and 81 percent are over 44; 77 percent have six or less years of schooling, and 46 percent are either unemployed or not in the labor force. All these factors are causal in the fact that average individual survey income is \$1,447 compared to an average family



survey income of \$3,273.<sup>12</sup> Probably more meaningful are the age and educational level characteristics, which suggest consumption habits distinctive from those of families. Finally, the simple phenomenon of a person living unattached relative to the same person living within a family unit implies modified consumption forms; for example, it would not be expected that expenditures on food would increase proportionally as the individual moves from his unattached status to inclusion in a family unit. This is strictly hypothetical, however, since the survey individuals cannot, by definition, lose their singular status. In conclusion, the direction of the bias in the consumer expenditure distributive series brought about by the exclusion of individuals is unknown; it may be postulated that the bias, if existent, is distributionally neutral--and given the data gap this is the sole recourse.

A further problem of non-coverage arises when total consumption spending of the survey is compared to total consumer outlays as estimated in the national accounts. Labor survey aggregate consumption amounts to \$1,403.7 million compared to \$1,906 million in the social accounts estimates, or 74 percent of the latter; this difference can perhaps be theoretically accounted for by noting the exclusion of outlays by individuals from the survey total and

by reference to the discrepancy between total population and survey-covered population. Moreover, the nature of the survey might suggest a considerable margin of under-reporting by those interviewed families which comprise the sample. Once again it might be implied that such under-reportage is distributionally neutral.

Other Statistical Bases--The Newman Procedure<sup>13</sup>

Several of the distributive series utilized in the study are derived from data provided by work sheets of the Puerto Rican Department of the Treasury.<sup>14</sup> Before use is made of such data they undergo certain adjustments because the Treasury classifies its figures by adjusted gross income brackets, whereas throughout this investigation a family money income group classification is employed. The principal difference between these two income grouping methods consists in the exclusion from adjusted gross income of various public transfer payments which are regarded as inclusions in family money income; since public transfers represent a large proportion of family income in the lower bracket(s) their exclusion from Treasury data introduces a margin of error in those series calculated from the work sheets. Therefore, the Treasury brackets are adjusted to the family money income brackets following a procedure developed by Peter Newman.

Reference is had to Table 5 for the Newman adjustment derivation. Attention is first directed to Line 6--transfers--which does not include all public transfers but only those which are excluded from gross personal income and at the same time can be rationally distributed by available series (federal OASDI benefits, Commonwealth relief grants, unemployment compensation, and disability payments--see Table A-16). Following the designation of Newman and the Survey of Consumer Finances of the University of Michigan the concept labeled "gross factor income" is derived and distributed by family money income classes (Line 7). Gross factor income is roughly equivalent to money income plus imputed rent on owner-occupied homes and homegrown food less public transfers. Lines 8 and 9 show the resulting distribution of mean (per family) gross factor income and mean transfers. After subtracting per family income in kind from mean gross factor income mean transfers as a proportion of mean money income are calculated for each income class (Line 12--note that mean money income includes transfers; that is, money income is equivalent to gross factor income plus transfers less income in kind).

The precision of the data and the calculations leading to the results of Line 12 can easily be called into question for a number of reasons. It has already been observed that

TABLE 5

RELATIVE IMPORTANCE OF PUBLIC TRANSFER PAYMENTS IN INCOME,  
BY INCOME CLASS, 1963  
(The Newman Procedure)

Line	Item <sup>a</sup>	Less than \$1,000	\$1,000- \$1,999	\$2,000- \$2,999	\$3,000- \$3,999	\$4,000- \$4,999	\$5,000- \$7,499	\$7,500- and over	Total
1.	Family Income	51.3	181.1	239.9	175.0	158.4	264.0	439.1	1,508.9
2.	Individual Income	12.0	10.3	6.2	6.5	6.0	4.7	10.9	56.4
3.	Gross Imputed Rent	0.5	2.4	5.6	8.4	8.5	20.1	81.2	126.7
4.	Homegrown Food	<u>2.2</u>	<u>5.0</u>	<u>3.6</u>	<u>1.3</u>	<u>1.3</u>	<u>0.7</u>	<u>0.3</u>	<u>14.3</u>
5.	Total	66.0	198.8	255.3	191.2	174.2	289.5	531.5	1,706.3
6.	Less: Transfers <sup>b</sup>	18.9	37.3	24.7	10.1	7.2	6.6	7.3	112.0
7.	Total--Gross Factor Income	47.1	161.5	230.6	181.1	167.0	282.9	524.2	1,594.3
8.	Per Family Gross Factor Income	612	1,337	2,359	3,539	4,767	6,459	14,767	3,458
9.	Per Family Transfers	246	308	253	198	206	150	205	243
10.	Per Family Income in Kind	353	345	292	254	273	310	268	310
11.	Per Family Monetary Income	259	992	2,067	3,285	4,494	6,149	14,499	3,148

12. Per Family Transfer  
as Proportion of Per  
Family Money Income

49 24 11 6 4 2 1 -

Notes: Details may not sum to totals due to rounding.

aThe items in Lines 1-7 are in millions of dollars.

bDoes not include all public transfers. See text explanation and Table A-16.

Sources:

Lines 1-3 - Table 1, Lines 1, 2, and 5 respectively.

Line 4 - Department of Labor of Puerto Rico, Income and Expenditures of the Families, Puerto Rico, 1963, Report 2, Family Income by Source of Income (San Juan: June, 1967), p. 54. Totals are calculated by multiplying the average value of food produced and consumed in the family unit by the number of families (excluding unattached individuals) in each income class.

Line 5 - Sum of Lines 1-4.

Line 6 - From Table A-16, Line 5.

Line 7 - Line 5 minus Line 6.

Line 8 - Line 7 divided by the number of families (excluding individuals) in each income group.

Line 9 - Line 6 divided by the number of families (excluding individuals) in each income group.

Line 10- Department of Labor of Puerto Rico, Income and Expenditures, Report 2, p. 51. Includes not only homegrown food but all other types of income in kind.

Line 11- Line 8 minus Line 10.

Line 12- Line 9 divided by the sum of Lines 8 and 9 less Line 10.

the definition of gross factor income is quite rough and cannot be deemed all-inclusive; moreover, the distributions of Lines 1-4 are derived from the Labor survey, the income base of which has previously been rejected in favor of a base constructed from national accounts aggregates. The rationale behind this is, of course, to avoid circularity; that is, if the national accounts totals are used to effectuate the Newman adjustments to modify the Treasury distributive series which are in turn utilized to distribute the social accounts aggregates nothing would have been accomplished. Finally, the family distribution employed to compute the various means is exclusive of individuals. Due to the apparent roughness of the estimates of Line 12 the share of the lowest adjusted gross income bracket is reduced by 40 percent (instead of the computed 49 percent) because on a family money income basis (including transfers) those in the lowest adjusted gross income bracket would fall approximately in the "less than \$1,400" bracket--if there were such a bracket. The 40 percent portion removed from the "less than \$1,000" class is then added to the next highest class (\$1,000-\$1,999); in a similar manner the share of the \$1,000-\$1,999 adjusted gross income bracket is reduced by 20 percent (instead of the computed 24 percent) and added to the next class (\$2,000-\$2,999). Subsequent

brackets are reduced by 10 percent, 6 percent, 4 percent, and 2 percent. Note that the 20 percent removed from the \$1,000-\$1,999 class corresponds to the original data in that bracket, and not to the original figures plus the 40 percent addition. Adjustments for all income brackets of all the Treasury work sheet series are carried out in the same fashion and can be found in the distributive series table (Table A-1).

Two further observations are in point. The Treasury data refer to the taxable and non-taxable returns of individual taxpayers, while the Labor data relate to families. Adjustments for this difference would involve a great deal more work than is justified by the few totals allocated by the Treasury-derived series.<sup>15</sup> The inclusion of both taxable and non-taxable returns corrects an error that would be incorporated if taxable returns alone are accounted for in the analysis. The existence of a tax liability in a given tax year is dependent upon the relative amounts of gains and losses from all taxable income sources, and relevant to this study is the incidence of "average" losses by income class; for example, repeal of the corporate profits tax would most likely lead to increased dividend income, in the process converting some non-taxable returns into taxable ones. Thus, exclusion of non-taxable returns

would have the effect of making the tax liability distribution more progressive.<sup>16</sup>



## NOTES

1. For complete definitions of all the inclusions in the survey's money income concept see Department of Labor of Puerto Rico, Report 1-A, p. iv, and Report 2, pp. v-vii. For further clarification of these definitions the original sample survey form and the key system for machine tabulation were also studied and discussed with Labor Department personnel. All data from the Labor survey relate to calendar year 1963 while most of the data from other sources relate to fiscal years. In the latter case an arithmetic average of fiscal years 1963 and 1964 is taken in an attempt to adjust the figures more closely to calendar year 1963. Unless otherwise specified then, data used throughout the study correspond to calendar year 1963, either as given or as adjusted.

2. Junta de Planificación, Negociado de Análisis Económico y Social, División de Estadísticas, Anuario Estadístico, Puerto Rico, 1967, p. 1.

3. Department of Labor of Puerto Rico, Report 1-A, p. 7.

4. Department of Labor of Puerto Rico, Report 1-C, pp. 57-62. When asked the reason for the limited coverage Labor Department personnel responded that the effort did not justify the results; moreover, funds were scarce.

5. This information was gathered from interviews. The national accounts do include in income statistics military personnel stationed in Puerto Rico independently of their normal place of residence and exclude those Puerto Ricans serving outside the island.

6. The numerator value, the value of total non-resident investment, is from Junta de Planificación, Negociado de Análisis Económico y Social, Sección de Balanza de Pagos, Balanza de Pagos, Puerto Rico, 1969 (San Juan: 1970), p. 48.

7. Charles P. Kindleberger, Economic Development (New York: McGraw-Hill, 1965), p. 89.

8. Not only is the function linear of the type  $Y = a + bK$  ( $Y$  is output,  $K$  is capital) but  $a$  is equal to zero; that is, there is no intercept.

9. J. H. Adler and K. S. Krishnaswamy, "Comments on Professor Byé's Paper," in Howard S. Ellis (ed.), Economic Development for Latin America (New York: St. Martin's Press, 1961), p. 126.

10. Kindleberger, p. 92.

11. Department of Labor of Puerto Rico, Report 4-A, pp. 38-47. For each income class the average family expenditure by item is given. The average outlay is then multiplied by the number of families in each class to derive absolute expenditure series, from which the percentage distributions are computed. The section above which discussed the distribution of families used throughout most of the study necessarily includes families and unattached individuals in the definition of the family unit since both experience a tax burden and benefit from public expenditures. However, for reasons explained in the text, the consumer expenditure distributive series refer solely to families exclusive of individuals. The rounded sum of the total number of families and unattached individuals in each income group appears in text Table 3.

12. The data on the individual characteristics are from Department of Labor of Puerto Rico, Report 1-C, pp. 57-62.

13. Newman, paragraphs 4.12-4.14.

14. Before the Newman adjustments are made to the raw Treasury data certain other adjustments are undertaken. The lowest Treasury adjusted gross income bracket is "less than \$2,000" so it is assumed that 80 percent of the dividend, interest income, taxes paid on residential property, and interest paid on taxpayer's personal indebtedness totals in this bracket fall in the \$1,000-\$1,999 family money income class. The Treasury's middle three brackets are comparable to those of this study; however, Treasury presents \$5,000-\$5,999 and \$6,000-\$7,999 brackets. It is assumed that 80 percent of the sum total of the four items fall in the \$5,000-\$7,499 family income group, the remaining 20 percent being added to the "\$7,500 and over" class. Precise linear

interpolation would have allocated 83.3 percent to the \$5,000-\$7,499 class, but the distributions are skewed toward the higher brackets.

15. For a description of the enormous amount of work this would entail see United States Department of Commerce, Income Distribution in the United States by Size, 1944-1950, in supplement to the Survey of Current Business (Washington: U.S. Government Printing Office, 1953), Part I, Section 4.

16. Newman, paragraph 4.9.

### CHAPTER III

#### THE BURDEN OF THE OVERALL TAX STRUCTURE

Given Puerto Rico's highly centralized public sector the tax burden is largely that imposed by the central government, although, as may be noted in Table 6, the municipal governments do levy a minimal amount of their own taxes. It is estimated that in calendar year 1963 total taxes levied on Puerto Rican residents totaled \$420.3 million, calendar year 1963 representing a simple arithmetic average of data corresponding to fiscal years 1963 and 1964. Most of the fiscal year data are extracted from official published sources, although in the cases of the property and social insurance taxes unpublished work sheet data are utilized. It should be pointed out that social insurance contributions are included as part of the total tax burden, but the tables have been arranged to allow for exclusion because of possible theoretical objections to such inclusion; a similar procedure is followed for lottery "taxes."

Table 6 shows the relative importance of each type of tax. Social insurance contributions comprise the largest individual item of taxes paid by the resident taxpayer (31

TABLE 6  
TAX PAYMENTS NET OF SOCIAL INSURANCE  
CONTRIBUTIONS AND NET OF EXPORTED PORTION, 1963  
(millions of dollars)

Type of Tax	(1) Total Tax Payment	(2) Percent of Total	(3) Net of Social Insurance	(4) Percent of Total	(5) Net of Exported Portion	(6) Percent of Total
Personal Income	56.4	13.4	56.4	19.4	56.4	14.4
Corporate Income	38.0	9.0	38.0	13.1	24.3 <sup>a</sup>	6.2
Internal Excises	121.4	28.9	121.4	41.7	115.6	29.5
Customs Duties	12.3	2.9	12.3	4.2	12.3	3.1
Property	32.9	7.8	32.9	11.3	23.4	6.0
Inheritance and Gift	2.7	0.6	2.7	0.9	2.7	0.7
License	12.3	2.9	12.3	4.2	12.3	3.1

Municipal	4.1	1.0	4.1	1.4	4.1	1.1
Lottery	10.9	2.6	10.9	3.7	10.9 <sup>b</sup>	2.8
Social Insurance	129.3	30.8	0	0	129.3	33.0
Total <sup>c</sup>	420.3	100.0	291.0	100.0	391.3	100.0

<sup>a</sup>Standard Case assumptions.

<sup>b</sup>Although a portion of lottery "taxes" is most likely exported through off-island sales data unavailability regarding such sales prohibits any rational assumption from being made.

<sup>c</sup>Details may not sum to totals due to rounding.

Sources:

Columns (1)-(4) from Table A-3; columns (5) and (6) from assumptions set forth in the text, pages 53-82.

percent). Note that total tax payments do not revert entirely to the Commonwealth treasury since over half of the social insurance taxes are federal levies. Taxes paid and tax revenue collected are not, therefore, interchangeable terms. The contribution to total tax payments of internal excise taxes follows close behind at 29 percent (the term "internal excise" is used to distinguish the commodity taxes levied under Puerto Rican fiscal law from the external excises--customs duties--levied under federal statutes but returned to the Puerto Rican government). Personal income taxes (13 percent), corporate income taxes (9 percent), and property taxes (8 percent) follow in order of relative magnitude, but it is readily appreciated that the inclusion of social insurance taxes, and especially of federal social insurance contributions, presents a first-glance "distortion" of the Commonwealth's tax structure. To correct this impression reference should be had to Column (4) of Table 6, which excludes social insurance taxes.

Since Puerto Rico is one of the prime examples of an open economy it would be absurd to proceed on the assumption of a closed economy as have so many studies of this nature on the United States and Great Britain (the Bhatia Puerto Rican study posits a closed system with one minor exception). In a system with such a large degree of openness

the probability of tax exportation is evident, and estimates of the scale of exportation should be included. For those taxes levied wholly or partially on capital (the corporate income and property taxes) or on consumption (for example, internal excises) estimates have been made of that part of such taxes exported to non-residents. It cannot be emphasized enough that the calculation in dollar terms of the portion exported is quite crude. Nevertheless, it is thought better to proceed along these lines than to assume a closed economy and subsequent non-exportation of taxes.

Using a published source to find the value of non-resident investment in Puerto Rico,<sup>1</sup> and estimating the value of total investment by means of a capital-output ratio calculated as an average of the incremental capital-output ratio over the 17-year period prior to and including fiscal year 1964, it is assumed that 44 percent of ownership in Puerto Rican companies is held by non-residents.<sup>2</sup> Thus, the exported portion of those parts of the corporate income and property taxes which are assumed to fall on capital is measured by the ratio of the value of non-resident investment in Puerto Rico to the value of total investment. Theoretically this procedure is justified on the grounds that non-residents, participating in the ownership of real and/or portfolio investments, additionally participate in



the tax burden. Thus, in the case of the corporate income tax the unshifted portion is assumed to be borne by both resident and non-resident shareholders; it is only logical to assume that the tax affects all profits in a similar fashion, and not that it affects, for example, resident profits in a dissimilar manner from non-resident profits. Therefore that part of the unshifted corporate profits tax which is borne by non-residents is excluded from the subsequent analysis. Moreover, when and if the property or corporate income tax (or a fraction thereof) is assumed shifted forward to consumers tax exportation occurs through the simple mechanism of exports; that is, goods produced in Puerto Rico but sold elsewhere reflect forward shifting in the form of higher prices just as much as do goods produced and consumed locally. In 1963 Puerto Rican merchandise exports amount to 37.1 percent of gross domestic product;<sup>3</sup> thus, 62.9 percent of gross domestic product is bought by residents, and it is therefore assumed that Puerto Rican consumers bear only 62.9 percent of the forward shifted parts of the corporate and property tax levies. A third form of tax exportation which is assumed to occur in Puerto Rico's tourist-oriented economy, and which is probably operative to a lesser extent in other open economies, functions through tourist expenditures on excise tax subjected

goods. Tourist outlays in 1963 total some 4.8 percent of total personal consumption expenditures, so that it is assumed that 95.2 percent of internal excise payments fall on residents.<sup>4</sup> Given the magnitude of internal excises in the Commonwealth's tax structure this apparently small percentage leads to an exported sum of \$5.8 million.

Of course, if the structure of the Puerto Rican economy is such that tax exportation occurs then it is more than probable that tax importation is also a phenomenon. Disregarding the obvious and direct importation of federal social insurance contributions it would be possible to arrive at an estimate of federal taxes borne by residents of the island (the importation of taxes from other countries would be positive but negligible since the amount of economic transactions Puerto Rico has with nations other than the U.S. is small). A relevant methodology to be used has been developed by Labovitz<sup>5</sup> and applied for the corporate income tax and payroll taxes by the United States-Puerto Rico Status Commission.<sup>6</sup> However, this study ignores tax importation on the grounds that such taxes are not Puerto Rican government tax structure variables.<sup>7</sup>

#### The Personal Income Tax

It is assumed that the personal income tax is a non-shiftable levy borne by those upon whom it is imposed. That

the tax is not shifted can neither be proved nor disproved on theoretical or empirical grounds, and the assumption of non-shiftability of this tax is a trademark of tax burden studies.<sup>8</sup>

Theoretically the assumption revolves around the proposition that the total supplies of the factors labor and capital are fixed. With respect to the first factor of production, labor, the introduction of the personal income tax into a non-tax situation will probably affect one's choice between two assumed alternatives, leisure and work (or, to use Musgrave's alternatives, leisure and income). The direction of change in one's choice caused by the tax will depend upon the shape of curvature of the leisure-income indifference curves, the latter being dependent upon the marginal utilities of leisure and income.<sup>9</sup> With a given indifference map a proportional income tax involves a substitution effect and an income effect, the former encouraging the substitution of more leisure for income since work (income) is more costly and the latter having the opposite effect of stimulating the substitution of more work for leisure in order to maintain original net income levels. Given the impossibility of measuring marginal utility and thus knowing the shape of the indifference maps of individuals no conclusion can be reached regarding the influence of the personal income tax

on the income-leisure choice; that is, on the supply of labor. Therefore the logical assumption follows that the personal income tax falls entirely on the individual payee. Much the same conclusion follows when the total labor supply is considered, although the effects are much more complicated than when individual work effort alone is under study. As Musgrave suggests, when a proportional income tax is replaced by an equal yield progressive income tax (public expenditures constant) varying changes occur in both the average and marginal rates of taxation--high income individuals experience increases and low income individuals decreases in the average and marginal rates. There is simply no reasonable manner of predicting what the net result on the total number of individuals will be.<sup>10</sup> However, although the total supply of labor must necessarily be assumed fixed the personal income tax may have some effect upon the allocation as between types of work due to the fact that the tax differs in its coverage of various forms of income. If this is so prices will be affected, resulting in an indeterminate amount of shifting to the consumer.<sup>11</sup>

With respect to the second factor of production, capital, the fixed supply assumption is again open to doubt when a personal income tax on capital income is either introduced into a non-tax context or when various alterna-

tive tax schedules are theoretically analyzed. In this case the non-shiftability assumption must posit, first of all, that the total supply of funds for both financial and real investment does not change as the income tax schedules on capital income vary. Since it is highly likely that the after-tax rate of return on capital is a determinant of the total supply of funds (and perhaps of saving), and since an income tax on capital will at some point on a theoretical optimum-asset, yield-risk indifference surface reduce the supply of loanable funds, the tax may be partially shifted forward in the form of higher prices. Moreover, the price structure may be changed via the process of capital shifts from less advantageous to more advantageous uses vis-à-vis the personal income tax; for example, capital gains income receives more generous treatment in the tax statutes than does short-term non-capital gains income, or tax-free municipals channel funds into lower risk forms of investment. Again, however, as is the case with labor, any a priori assumptions as to capital supply changes would be too presumptuous, and it is assumed that the personal income tax on capital income is not shifted.<sup>12</sup>

The \$56.4 million of personal income taxes paid by Puerto Rican residents is distributed according to adjusted Treasury data even though these data refer to individual

taxpayers and not to the family units of the study;<sup>13</sup> data on taxes paid by family units are available from the Department of Labor survey, and are presented in the source to Line 22 of Table A-1. However, the taxes included in the survey consist of a number of unspecified levies, and further breakdown by type is not available. Accordingly, resort is necessarily had to the Treasury work sheet figures. Precisely how much distortion this causes is questionable, but may well be insignificant in light of the adjustments made to the data by means of the process described by Newman. The adjustments to the raw Treasury data explained in note 14 of Chapter II may appear objectionable but are nevertheless necessary. Moreover, they involve less than 1 percent of the \$56.4 million total.

#### The Corporate Income Tax

A review of the literature concerning the incidence of the corporate profits tax reveals a remarkable lack of consensus on this point, a lack which has become even more pronounced with the spate of empirical work of the 1960s. It was traditionally held that the tax was unshiftable in both the short and long runs, this conclusion arising out of the supposition that the firm fully pursues profit maximization and that economic profit and accounting profit could be treated analytically in a similar manner.<sup>14</sup> In the late

1940s and early 1950s a basic three-way split occurred in analysis of the question, and empirical studies attempted to solidify the theoretical under-pinnings of the conflicting viewpoints.<sup>15</sup> One group of writers, of whom M. A. Adelman is perhaps the most prominent, held the view that little or none of the tax is shifted;<sup>16</sup> a middle group sustained that shifting did occur, but in indeterminate amounts; a third group, buttressed by the work of Lerner-Hendriksen<sup>17</sup> and Clendenin<sup>18</sup> felt that a rather large part of the tax was shifted. The principal fault of the empirical studies done in this period was that, in their attempt to analyze the relationship between the rates of return or factor shares and the corporate tax rate, they did not allow for all the other factors which may possibly affect the rates of return and/or the factor shares.

The still-debated Musgrave-Krzyzaniak 1963 short-run econometric analysis, which purported to isolate through the use of multiple regression techniques and a profit behavior model the effects of the corporate tax on manufacturing rates of return, served to fuel the controversy;<sup>19</sup> the model, even when revised in the light of criticism and when applied to the Canadian and West German experiences, showed levels of forward shifting of 100 percent or more.<sup>20</sup> The critics of the study have either made revisions of the model

itself--Goode, Slitor,<sup>21</sup> Cragg, Harberger, and Mieszkowski<sup>22</sup>--or have developed different approaches--Gordon.<sup>23</sup> These critics are unified in their objections by the idea that the Musgrave-Krzyzaniak model is not correctly specified, and that when more relevant variables are added the degree of shifting is reduced--Goode and Slitor--or becomes insignificant--Cragg, Harberger, and Mieszkowski.<sup>24</sup>

Given the inconclusive (and as yet unending) nature of the problem, and taking into account the apparent complete absence of any work done on the Puerto Rican experience, several shifting assumptions have been postulated. First of all a Standard Case is hypothesized in which 40 percent of the corporate profits tax is assumed absorbed by profits, 50 percent is shifted forward, and 10 percent is shifted backward. Additionally, five alternative cases with differing shifting assumptions are posed (see Table A-6). All cases represent qualitative rather than quantitative opinion and cannot be considered exhaustive.

Under the Standard Case assumptions, then, \$15.2 million falls on corporate profits, \$19 million is passed forward to consumers, and \$3.8 million falls on wages and salaries. However, part of the total of \$38 million is exported. In the first place the portion borne by profits must be assumed to reduce in equal proportions both the



income of resident and non-resident shareholders through lower dividend distributions. Since non-resident shareholders are to be excluded from the study results it becomes necessary to omit that amount borne by them and to include only that amount borne by resident stockholders. There are at least two perfectly logical ways to proceed, the first expounded by Goffman and the second by Gillespie.<sup>25</sup> Goffman computes the ratio of dividends received by residents to total corporate after-tax profits and multiplies the resulting percentage by the total original amount assumed to be borne by profits; Gillespie utilizes the ratio of the value of non-resident investment to the value of total investment, which is then multiplied by the amount of the tax absorbed by profits. There seems to be little to choose from either ratio, for they both appear to yield reasonable approaches to the same problem.<sup>26</sup> Since the data required for utilization of the Gillespie ratio has previously been presented and amplified upon (pages 29-35) recourse is made to his proportion. The difference between the two methods can be appreciated from the following table.

TABLE 7

TWO APPROACHES TO CORPORATE PROFIT TAX EXPORTATION  
(millions of dollars)

<u>Line</u>	<u>Allocation of Tax</u>	<u>Pre-Export</u>	<u>Post-Export Totals</u>	
		<u>Total</u>	<u>Gillespie</u>	<u>Goffman</u>
1	To Dividends	1.2	1.11	0.15
2	To Retained Earnings	14.0	7.40	0.97
3	To Wage Earners	3.8	3.80	3.80
4	<u>To Consumers</u>	<u>19.0</u>	<u>12.00</u>	<u>12.00</u>
5	Total	38.0	24.31	16.92

Note: The allocation of the \$15.2 million assumed to be borne by profits between dividends and retained earnings is derived by taking the proportion of dividends to net profits (13 percent) and multiplying it by 15.2. The suggestion for this procedure comes from R. A. Musgrave, J. J. Carroll, L. D. Cook, and L. Frane, "Distribution of Tax Payments by Income Groups: A Case Study for 1948," National Tax Journal, Vol. IV (March, 1951), p. 17.

Sources: See text and note 25 of this chapter.

The Gillespie ratio for Puerto Rico, as previously cited, is 0.44;<sup>27</sup> the Goffman ratio is 0.074, thereby accounting for the large disparity noted in Lines 1 and 2 above. Thus, use of the latter ratio would lower the burden of the corporate income tax on the Puerto Rican resident, although the overall tax burden would not be noticeably affected--with the exception of the highest income class.

Referring once more to Table 7, it is to be observed that the \$3.8 million attributed to wages and salaries is assumed borne in its entirety in Puerto Rico, but that the

50 percent passed forward is partially exported since not all goods produced on the island are consumed there. That portion of the \$19 million exported is computed by taking the total value of merchandise exports as a proportion of gross domestic product (37.1 percent);<sup>28</sup> therefore, Puerto Rican residents bear 62.9 percent, or \$12 million, of the forward shifted fraction of the tax.

An additional observation should be remarked upon in closing this section. One of the principal incentives for industry to locate in Puerto Rico has been the program of tax exemption permitted to qualifying firms. It would be possible to add to the corporate profits tax actually paid the imputed value of the corporate tax from the tax-exempt sector. This might be theoretically justifiable on the grounds that the Puerto Rican resident incurred the burden of not enjoying the public services these taxes would have funded, so that in effect it is part of the tax burden. Data on the total amount of taxes firms in the tax-exempt sector would have paid had they been subject to taxes is readily available--\$39.95 million and \$46.29 million in fiscal years 1963 and 1964 respectively;<sup>29</sup> these data refer to both incorporated and unincorporated firms. Nevertheless, the imputed corporate profits tax is excluded from the analysis.

The Internal Excises

It has been traditionally assumed that the burden of internal excise taxes falls entirely upon the consumer of the taxed product. Thus, an excise tax on alcoholic beverages is distributed in proportion to consumer outlays on such products. Justification for this supposition may be obtained from the following illustration:<sup>30</sup> Assume a two producer--X and Y--and a two product--A and B--context in which X and Y receive income, in equal proportions, from the sale of the two goods; further assume that producer X is a large consumer of good A. If an excise tax on good A is now substituted for an original proportional income tax both producers stand to benefit, as their relative factor incomes remain unchanged; that is, the tax substitution is neutral from the point of view of income sources. However, since the price of A rises relative to the price of B producer X finds himself worse off in comparison to producer Y from the income uses side of the equation. In the extreme case in which X consumes only good A and Y consumes only good B the total burden of the excise is shifted to producer X; in the more common case in which each producer consumes some of each good the tax burden, which falls in proportion to the consumption of good A, will leave producer X with a net loss and Y with a net gain. If good A

is a necessity (defined as a product on which the percentage of family income spent declines as income rises) the just-noted tax substitution will be regressive.

The above illustration that the excise tax burden can be distributed according to consumption patterns is necessarily based on the hypothesis that both producers share equally in the income from the production of the two goods in order that the change from the income uses side does not cause changes on the income sources side. This is not realistic but is capable of reinterpretation, for it is not necessary to calculate the distribution of excises by individuals--it is merely required to estimate the resulting distributional changes in the sum total of income. If it is assumed that the given income distribution originating in different industries is the same then changes in income sources may be ignored; it can be expected that this will remain so as long as there is a random relationship between the distributional source of expenditures on any good and the distributional destination of the factor payments which are made to produce the good. It is probably safe to state that such is the case, and that the procedure of ignoring income source changes is analytically justifiable.

It is to be noted that the hypothesis of complete forward shifting of internal excises is not based upon the

empirical observation that the absolute price of the taxed article rises by the amount of the tax;<sup>31</sup> the distributional changes in income which occur are instead the result of relative price changes in either or both the factor and product markets, a view primarily established by Musgrave and almost universally accepted.<sup>32</sup>

A viewpoint opposing that of the more prevalently held forward shifting approach is that expounded by Rolph,<sup>33</sup> who has modified and refined the ideas of H. G. Brown. Rolph's basic premise is that the excise tax burden is borne not by consumers but by factor owners in proportion to their incomes; that is, the partial excises are shifted backward. The analysis is carried out in terms of an absolute incidence context, rejecting the differential incidence and balanced-budget approaches, the former being the difference in the distributional results of varying tax policies which offer equal yield in real terms and the latter being the difference in the distributional consequences of varying real expenditures and tax functions in matching fashion. Rolph analyzes the distributional effect of changing tax parameters while ignoring both the use to which the public revenues are put and the structure and level of other taxes. He denies that the tax by itself imposes a burden--the real burden occurs when the government spends the collected

monies, taking resources away from private use. Given this concept of a tax it must follow that the tax burden, or the burden of public activity, is not affected by tax changes. A general excise tax burdens the factor owners by driving a wedge between firm revenues and factor payments, for as the tax reduces the firm's net price it will reduce output and the number of factor units employed. Assuming perfect competition in the factor markets a new equilibrium is reached, but accompanied by lower factor prices. In the case of partial excises similar adjustments will occur as the final product mix is modified, prices of untaxed and lightly taxed goods dropping and prices of heavily taxed goods rising.

Justice cannot be done here either to Rolph, to those who accept his conclusions with slight modification, or to his critics.<sup>34</sup> Suffice it to state that, as with the incidence of the corporate income tax, the question is far from settled. Despite what is perhaps his most "fundamental methodological error--that of assuming as constant things which, by the very nature of our analytical operation, must vary--"<sup>35</sup> he has reopened the door to a great deal of doubt concerning the incidence of partial (and general) excise taxes. To take these doubts into account three alternative shifting assumptions have been included in addition to the

"standard" assumption of 100 percent forward shifting. Alternative A shifts 20 percent of the internal excises to the factors, Alternative B shifts 50 percent backward, and Alternative C shifts the entire tax backward; these shares are then distributed according to factor income (Table A-1, Line 36). When this last step is taken a slight adjustment becomes necessary since some factor income is received by non-residents. The results of these alternative experiments are found in Table A-9.

Mention should be made of the recent literature on inter-regional incidence and its possible implications regarding the Puerto Rican case vis-à-vis its principal trading partner, the United States.<sup>36</sup> The absence of such trade barriers as tariffs and quotas (but not, obviously, transport costs) would perhaps bring one to treat Puerto Rico as another region within the continental federal system, thereby giving rise to the distinct probability of tax exportation and importation.

The McClure partial equilibrium, two economy model is concerned with the possible exportation of sales and production taxes (Puerto Rico does not levy a general sales tax); that is, with the determinants of geographic tax burdens. Above it is assumed that internal excises are neutral on the income sources side (factor incomes), but



McClure argues that it is unwarranted to posit that they are geographically neutral from the sources side (and from the income uses side). If a unit sales tax is applied on goods consumed in Economy 1--postulating both linear and general demand and supply functions, and assuming increasing costs--the greater the slope of the demand curve of consumers in the taxed market the greater will be the burden borne by consumers in Economy 1 and the lesser will be the gain of consumers in Economy 2 (the untaxed region). Taking a trio of similarly conclusive cases--an ad valorem tax on producers in one economy, an ad valorem tax on sales to consumers in one market alone, and a unit tax on production in one economy--and again postulating general and linear demand and supply functions, the following is the end result: if increasing costs are assumed the smaller the slope of the supply curve in the taxed region, the greater its slope in the untaxed region, and the greater the slope of the demand curves in both regions the larger are the changes in net and gross prices.

The McClure analysis is of little value to this study for a number of reasons. Firstly, application of the model requires knowledge of the slopes of the demand and supply curves and the amounts bought and sold in each market. The latter data are easily acquired, but the former involve

econometric estimates well beyond the scope of this study. Secondly, it has already been established that tax importation is to be ignored since it does not constitute a Commonwealth tax policy variable. Thirdly, excise tax exportation is of little quantitative significance since the largest part of excise tax revenue is derived from retail or wholesale level excises on imported goods (Puerto Rico does directly export excise levies under the off-shore excise taxes--arbitrios sobre embarques--on rum and tobacco which are returned to the Commonwealth treasury by the federal government; this program is not, however, directly related to the point under discussion). Those production level excises imposed locally fall upon goods which are predominantly consumed locally. Fourthly, a later McClure model of one perfectly immobile factor and of the assumption of complete specialization in the production of one commodity cannot be very feasibly applied to the U.S.-Puerto Rican context.<sup>37</sup>

#### Customs Duties

Although Puerto Rico falls within the United States tariff walls and has no control over the level or types of duties levied against imports from foreign (non-U.S.) countries, customs revenues collected by the authorities of the United States on Puerto Rican imports are returned to

the Commonwealth treasury. Thus, even though the duties cannot be said to represent insular tax policy variables they certainly form part of the overall tax burden absorbed by residents, and for purposes of the study are treated as Puerto Rican taxes. As are internal excises, it is assumed that customs duties are completely shifted forward and are distributed according to total consumption expenditures. Ideally, it would be better to distribute the total by consumption of imported products (to reiterate, imported products from non-U.S. sources), but it is likely that allocation on a total consumption basis does not lead to a large degree of distortion. No portion of the duty total is assumed exported, although tax exportation may theoretically occur in at least two ways: (1) by means of tourist expenditures and (2) by the use of imported, dutiable primary or intermediate goods which are incorporated in later-to-be exported consumer goods. Especially the latter process would appear to be operative in Puerto Rico even when some of these primary-intermediate imports are confined to free-trade zones. However, even if all such imports were assessed and the extreme assumption were posited that they consist entirely of capital goods, then a maximum of 37 percent of the total could be exported. When it is realized that customs duties comprise only 3.1 percent of total tax

payments (social insurance taxes included) this polar supposition would lead to a reduction of a mere 1 percent in total taxes paid by residents and to an even lesser reduction in the overall effective tax rate. Since the polar case does not reflect reality, calculation of the exported portion of customs duties would have a minute effect on the end result and does not appear to warrant the effort.

#### Property Taxes

The disaggregation of total property tax collections of \$32.9 million is accomplished principally by reliance on a 1957 tax incidence study<sup>38</sup> and by an accounting for the property tax revisions between that date and 1963. This procedure is necessitated by the dearth of compiled and/or detailed data from the Puerto Rican Treasury Department's Bureau of Property Assessment regarding the division between real and personal property taxes and further breakdowns within these two broad categories; additionally, exemptions are so multifarious that the property tax base is eroded to such an extent "that each family income group or each type of business enterprise may be considered as separate and often-times peculiar cases."<sup>39</sup>

Utilizing the Sigafos results, which are based on an extensive sampling of the Bureau of Property Assessment data, and taking into account the major changes in property

tax laws in the intervening period it is assumed that 75 percent of total collections fall on real property (\$24.7 million), the remainder (\$8.2 million) falling on personal property. The real property tax covers four areas--residential, industrial, commercial, and agricultural property--the latter three being classified as business property. Since Sigafos concluded that approximately 60 percent of real property taxes were levied on business property, and acknowledging the 1962 introduction of exemptions on the first \$15,000 of assessed value on owner-occupied residences, 75 percent of real property taxes are allocated to business (\$18.5 million), with the remainder (\$6.2 million) allocated to residences. Of the \$18.5 million allocated to business, land is assumed to account for 30 percent and business buildings and machinery (improvements) for 70 percent; this 30-70 ratio is chosen because of its consistency with estimates for the United States and with Sigafos' figures.<sup>40</sup> The tax on business land (\$5.6 million) is considered to be non-shiftable and thus to rest upon the owners of the sites at the time the tax is either increased or initially levied. This assumption is in accordance with Ricardian rent theory and its later neo-classical restatement, and is traditionally accepted.<sup>41</sup> Conventionally, then, this unshifted portion of the tax is

capitalized; that is, land prices will fall. However, as Netzer points out, empirical evidence on capitalization is unsatisfactory, and research is not as yet conclusive.<sup>42</sup> Moreover, there arises real doubt as to whether or not it is either theoretically or empirically possible to distinguish between the bare land and improvements on a given site. It is, for example, Edgeworth's position that the incidence of the real property tax is on the final user of the property and not on the site owner.<sup>43</sup> Despite these complications the tax on business land is distributed among residents according to dividend income, the exported portion being removed.<sup>44</sup>

Proceeding along orthodox lines it is assumed that not only is the tax on business buildings, machinery, and equipment separable but that it is shifted to consumers in its entirety, the rationale for the latter assumption being that the tax is treated as a cost of production to be passed forward. To be fair it must be stated that this viewpoint calls forth a variety of qualifications and is currently undergoing reappraisal.<sup>45</sup> Rolph and Break consider the probability that the property tax is shifted backward;<sup>46</sup> Richman points out that the commonly accepted views are only valid under partial static equilibrium conditions and under the assumption of perfectly inelastic total demand.<sup>47</sup> It is

his conclusion that a tax on real estate improvements is borne almost entirely by the landowner. Mieszkowski encounters difficulties in justifying the excise tax perception of the property tax and suggests a "drastic reorientation" in property tax incidence theory.<sup>48</sup> Nevertheless, the tax of \$12.9 million on business improvements is distributed according to total consumption after deducting the exported share.<sup>49</sup>

Passing to the 25 percent of the real property tax assumed to accrue to residential property (\$6.2 million), a disaggregation of two-thirds to owner-occupied residences and one-third to renter-occupied dwellings is posited. The Department of Labor study found 70 percent of Puerto Rican families living in owned dwellings, with a far greater proportion of rural families as compared to urban families possessing their own residences.<sup>50</sup> Since it is most likely the case that urban residences are on the whole more valuable than rural residences this factor is allowed for in reducing the proportion between owner-occupied and renter-occupied dwellings to 2:1 instead of 7:3. Working within a partial equilibrium framework the property tax on residential housing is assumed to be borne by the occupants, whether they be owners or renters. Due to the complete lack of data the land component is ignored, a step which probably

causes little distortion of reality since land is generally a relatively small fraction of total property value.<sup>51</sup> The qualifications raised by Netzer and Richman to the incidence of business real property taxes are equally applicable in this area; a special short-run obstacle to complete shifting to the renter occurs when a residence is not held as an investment and the owner is not sensitive to changes in tax rates. Brown reasoned that the property tax on dwellings would cause capital to transfer out of the housing industry, thereby falling on capital throughout the economy.<sup>52</sup> As above, however, no empirical heed is taken of the mentioned challenges to traditional theory. That part of the tax corresponding to owner-occupied residences (\$4.1 million) is distributed according to expenditures on owned dwellings, the best known series available;<sup>53</sup> that part corresponding to renter-occupied residences is distributed by a rent-paid series.

The personal property tax applies not to personal and non-business property but to business tangible and intangible property.<sup>54</sup> Sigafos calculated that corporations paid two-thirds of the personal property tax billings in 1957, with partnerships paying less than 10 percent and proprietorships paying up to 25 percent. Assuming little change in these proportions over the six-year span 75 per-



cent, or \$6.2 million, of the personal property tax is allocated to corporations and distributed according to the corporate income tax Standard Case assumptions; that is, 10 percent is shifted backward and distributed by wages and salaries, 40 percent is absorbed by profits, and 50 percent is shifted forward. In the latter two cases an exported portion is deducted before the final distribution is carried out.<sup>55</sup> That portion allocated to proprietorships (\$2.0 million) is distributed according to the net income of unincorporated businesses. It is of course probable that part of this share is exported, but the possibility will be ignored since there exists a much greater likelihood that resident capital composes much more than 56 percent ownership in this sector. It is to be observed that the shifting assumptions applied to business tangible and intangible personal property vary slightly from the traditional assumption that such taxes are shifted forward to consumers of business services. This variation is especially noticeable with respect to the portion allocated to proprietorships. Such divergence is purposeful in that it in part compensates for the previous rigidity of the conventional assumptions by taking into account the disagreements expressed against them.<sup>56</sup>

### Inheritance and Gift Taxes

Tax liability under Puerto Rico's inheritance and gift tax laws falls on the recipients, a situation dissimilar to that of the United States where such taxes, at least at the federal level, are liabilities of the donor. The available figures are not sufficient to permit distribution among income classes, although Sigafoos did attempt to research this point;<sup>57</sup> he found that in fiscal 1957, when the tax yield amounted to about \$1.4 million, only 453 cases were subject to tax. Of these cases 4 percent paid 57 percent of the tax while one case accounted for 24 percent of the total. On the other hand, almost two-thirds of the cases involved net estates with values of \$5,000 or less. The "effective tax rate points to the nominal impact throughout the entire range of the 453 net taxable estates."<sup>58</sup> Given this conclusion it might be deemed feasible to allocate the total levies among all or most of the family income brackets employed in this study. However, owing to the lack of conclusive evidence, taking into account the high level of exemptions, loopholes, and evasion,<sup>59</sup> and noting the relative unimportance of the inheritance and gift taxes--0.7 percent of total taxes net of the exported portion--it is decided to allocate the tax in its entirety to the highest income class.<sup>60</sup> This assumption is less defensible in the

Puerto Rican case where the recipient bears the burden than in the United States case where the donor statutorily sustains the burden, but further delving into the matter is not thought to merit the effort because of the small amount involved.<sup>61</sup>

#### License and Municipal Taxes

Commonwealth license taxes and taxes levied by the municipalities (excluding property taxes) are considered together because of their similarity of incidence; that is, they are both treated as levies whose burden either lies with the consumer or is passed forward to him.

The most important component of the central government's license tax collections is motor vehicle licenses.<sup>62</sup> This tax varies directly with the value of each category of vehicle, thereby permitting the assumption that it is also directly related to income. Because of the unavailability of data showing the relation between motor vehicle license payments and income groups, 85 percent of the total is allocated to private vehicles and distributed according to expenditures on private automobiles;<sup>63</sup> the remaining 15 percent is allocated to non-private vehicles and distributed according to total consumption. The \$2 million total corresponding to "other" licenses emanates principally from fees imposed upon retail and wholesale distributors and is also distributed according to total consumption.

Disregarding the theoretical difficulties created by the non-uniformity of municipal tax rates it is assumed that the entire amount is shifted forward and is therefore distributed in accordance with total consumption.<sup>64</sup> Although it may of course be argued that these business taxes are absorbed, at least in part, by the firms themselves, alternate shifting assumptions would only result in minimal changes in the overall effective tax rate pattern, and for this reason are not carried out.

#### Lottery "Taxes"

It is readily conceded that net central government revenue accruing from the operation of the insular lottery may not be conceived of as a tax. Nevertheless, it is considered here as a type of mass excise tax based upon the consumer's propensity to gamble, and is therefore legitimately included in the overall tax burden. A greater doubt arises as to its inclusion because the distributive series used to allocate the net total is indisputably defective; that is, if it cannot be rationally allocated among income brackets exclusion from the analysis would be the best policy. The net amount is distributed by a series entitled "Miscellaneous Expenditures" in which one of various items is lottery ticket purchases. No further breakdown of the series is possible. Given the dubiety on the above two

counts of lottery "tax" incorporation in a tax incidence investigation, the tabular presentation is such that the lottery impost may be omitted if desired. Exportation of a portion of the tax through off-island sales is a distinct possibility, but the scarcity or non-existence of data in this matter prohibits a rational assumption; accordingly, residents are assumed to bear the entire burden.

### Social Insurance Contributions

The most striking fact regarding the place of social insurance taxes in the overall tax structure is the large proportion of total tax payments net of the exported portion they comprise--33 percent. This high percentage contrasts sharply with that of other countries, but should come as no real surprise when the unique Puerto Rican politico-economic position is taken into account. The Puerto Rican resident is subject to two levels of social security taxes, those of the Commonwealth and those of the United States federal government. If contributions to federal social insurance programs were excluded from the analysis such taxes would comprise approximately 18 percent of total net tax payments. The high proportion due to Commonwealth contributions alone is basically the result of a socially-oriented public policy; that due to federal contributions is primarily caused by the application of equal rates in an area with a per capita

income less than half of that of the poorest state of the Union.

As is general practice payroll taxes are included as part of the tax burden, although, as Musgrave notes, there is some doubt as to whether they should be included at all. First, in a solely tax burden study, it can be argued that since payroll taxes are contractually linked to benefits the differential incidence concept is inapplicable. However, in this study where both sides of the public budget are accounted for this argument does not stand. Second and more valid is the postulate that such taxes, given the quid pro quo nature of contributions and benefits, are more related to insurance acquisitions than to taxes. Granted that this may be true it is not sufficiently "conclusive" to warrant the exclusion of social security taxes from the analysis, for "not only are the contributions mandatory, but there are substantial redistributational elements in the benefit formulas."<sup>65</sup> Moreover, the quid pro quo position is difficult to reconcile with the employer contribution.

Theoretically, it is assumed that selective factor taxes burden the recipient. This conclusion presents no difficulty if factor supplies are fixed, but if the supply of a factor falls due to the tax then the resulting changes in relative factor prices will affect relative product

prices. The latter changes, in turn, may cause income redistribution either from the income uses or income sources side. As is argued in the case of excise taxes it is assumed that those effects originating on the income uses side are distributionally neutral and are therefore ignored. In a perfect market the distributional effects are similar whether the factor tax on salaries is levied on the buyer's or the seller's side of the market. Nevertheless, if the tax is imposed on the seller's side the usual practice is to allocate it to the wage earner; when imposed on the buyer's side it is assumed shifted to the consumer. This practice is justified under the hypothesis that the wage bargain is net of the employer but gross of the employee, a postulate that is not easily reconciled with that of an inelastic factor supply but one that must necessarily be made.<sup>66</sup> As a consequence it is assumed that in the general case 70 percent of the employer's contribution is shifted forward and distributed according to total consumption;<sup>67</sup> the remaining 30 percent of the employer's contribution and the totality of the employee contributions are assumed borne by the employee and distributed by "covered" wages and salaries.<sup>68</sup> The one exception to the above shifting assumptions occurs if the employer is the public sector itself, in which case no distribution of the government's share need be made.<sup>69</sup>

Tax Incidence--The Empirical Estimates

In calendar year 1963 it is estimated that Puerto Rican resident families paid a net total of \$391.3 million in taxes--after allowance is made for tax exportation. Of this total the lowest family income group contributes a minimal 2.6 percent, while the highest income group contributes almost 35 percent. In contrast to other studies the percentage contribution of successively higher income groups does not rise steadily. Rather, it increases over the first three brackets, declines over the \$3,000-\$3,999 and \$4,000-\$4,999 brackets, and then increases dramatically over the final two brackets.<sup>70</sup> Figure 1, a Lorenz curve, enables one to visualize not only the cumulative percentage distribution of tax payments but the proportion of total taxes paid by any given proportion of total families.<sup>71</sup> If the tax burden were equally distributed among all families 10 percent of the families would pay 10 percent of the total taxes, 20 percent of the families would pay 20 percent of the taxes, etc. Equality of distribution would yield a 45-degree line--the line of equality--rising from the origin to the upper right-hand corner of the figure. Perfect inequality--over 99 percent of the families paying no taxes--would be represented by a right angle curve. The actual distribution of the tax contributions falls between these two extremes,



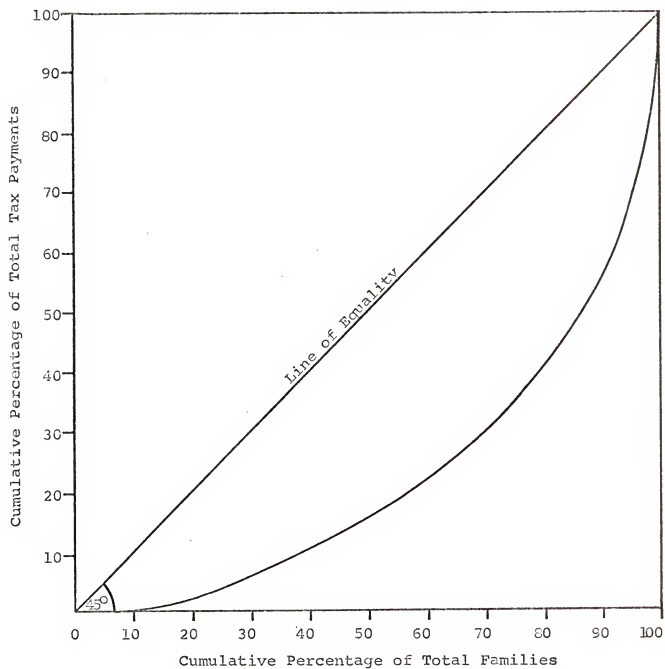


FIGURE 1  
TOTAL TAX PAYMENTS BY FAMILIES, CUMULATIVE, 1963

Source: Tables 3 and A-4.

and is represented by the unbroken curved line rising from the origin at 0 to the diagonally opposite corner. Dividing the total number of families into quintiles it is observed that the lowest fifth pays approximately 2.5 percent of the total, the second fifth 7.5 percent, the third quintile 12 percent, the fourth quintile 19 percent, and the highest fifth 59 percent. Looked at in a slightly different form, one-half of the families pay about 16 percent, with the other half paying the remaining 84 percent. While these data are somewhat meaningful with respect to the progressivity of the tax structure they do not indicate a sufficient condition but merely a necessary one, thereby emphasizing the need to express tax payments as proportions of a definite income base.

Two alternative income bases are utilized to compute the effective tax rates for each tax and for the overall tax structure. The broad income base, employed to a greater extent in the study, is thought to be more complete, but a less inclusive base--money and imputed income--is used on occasion. Both have already been defined. Table 8 and Figure 2 present the pattern of total tax incidence for calendar year 1963 using the broad income base.<sup>72</sup> The total tax structure (Line 11) is progressive over the first four income classes, regressive over the next (\$4,000-\$4,999)

TABLE 8

EFFECTIVE TAX INCIDENCE, BY TYPE OF TAX AND TOTAL TAX STRUCTURE, 1963  
(broad income base)

Line	Tax	Percentages									
		Less than \$1,000	\$1,000-\$1,999	\$2,000-\$2,999	\$3,000-\$3,999	\$4,000-\$4,999	\$5,000-\$7,500				
1.	Personal Income	0.1	0.2	0.4	0.8	1.1	2.1	5.8	2.6		
2.	Corporate Income	0.7	0.8	0.9	0.9	0.8	0.9	1.6	1.1		
3.	Internal Excises	4.9	6.0	6.0	6.5	4.9	6.1	3.9	5.2		
4.	Customs Duties	0.7	0.7	0.6	0.6	0.6	0.6	0.4	0.6		
5.	Property	0.8	0.8	0.9	0.9	0.9	1.1	1.3	1.1		
6.	Inheritance and Gift	-	-	-	-	-	-	0.4	0.1		
7.	License	0.2	0.3	0.4	0.6	0.6	0.8	0.6	0.6		
8.	Municipal	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2		
9.	Lottery	0.4	0.4	0.5	0.4	0.5	0.5	0.6	0.5		

10. Social Insurance	<u>5.2</u>	<u>6.5</u>	<u>7.2</u>	<u>7.5</u>	<u>7.4</u>	<u>6.4</u>	<u>3.8</u>	<u>5.9</u>
11. Total	13.2	15.8	17.0	18.6	17.0	18.8	18.5	17.7
12. Total, Excluding Social Insurance and Lottery	7.6	8.9	9.3	10.7	9.1	11.8	14.1	11.4
13. Total, Excluding Federal Social Insurance	10.3	12.0	12.7	14.0	12.5	15.3	16.8	14.4

Note: Details may not sum to totals due to rounding.

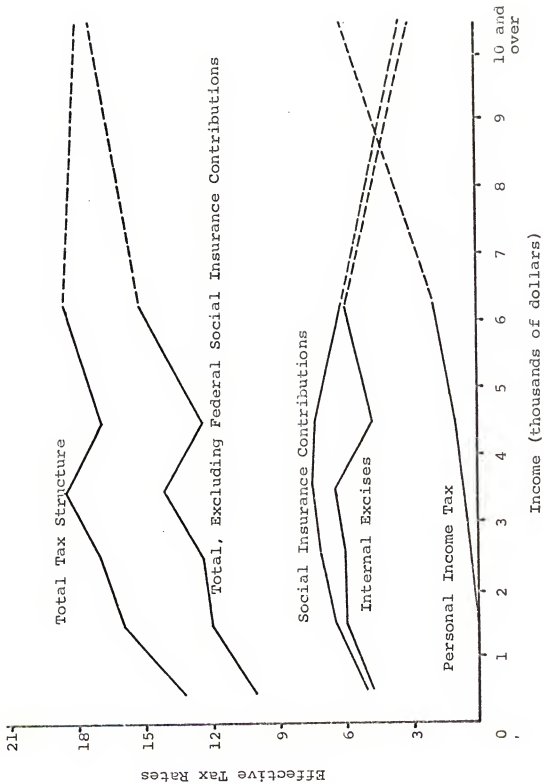
Source:

Each line of the distributions of tax payments, Table A-4, is expressed as a percentage of broad income, Table A-2, Line 8.

FIGURE 2

EFFECTIVE TOTAL TAX INCIDENCE AND INCIDENCE OF  
SELECTED TAXES, PUERTO RICO, 1963  
(broad income base)

Source: Table 8.



income class, continues its progressivity into the \$5,000-\$7,499 income group, and then becomes slightly regressive again; it should be recalled that the open-endedness of the highest income class, necessitated by lack of data, makes it impossible to arrive at conclusions regarding the incidence of the tax structure within that class. The almost trivial regressivity from the \$5,000-\$7,499 income class into the "\$7,500 and over" class disappears when all social insurance contributions and federal social insurance contributions are excluded (Lines 12 and 13 respectively), but the regressiveness remains when movement is made from the \$3,000-\$3,999 class into the \$4,000-\$4,999 class. This appears to be due almost entirely to the excise tax structure, which follows the same pattern as the overall tax structure. Within the former the causal excises influencing this pattern are those on alcoholic beverages and tobacco products (see Table A-8).

The personal income tax is progressive over the entire income range, as is the property tax; the corporate income tax is progressive throughout the entire range with the exception of the \$4,000-\$4,999 income class (Standard Case assumptions). Municipal taxes are proportional up until the highest income class. Social insurance contributions are progressive over the first four income groups but regressive over the last three brackets, due largely to the structure of federal OASDI payments.

Table 9 and Figure 3 reveal little difference in the pattern of the total tax structure and of individual taxes when the money and imputed income base is utilized. Again the overall structure is progressive over the first four income groups, regressive into the \$4,000-\$4,999 income class, and progressive throughout the remainder of the income range, thus inserting a distinction with that of the broad income base which displays slight regressivity into the highest income bracket. The tax structure excluding social insurance contributions in the first instance (Line 12) and federal social insurance contributions in the second instance (Line 13) reveals exactly the same pattern of progressivity-regressivity-progressivity as does the overall structure. In this case the personal income tax is even more progressive over the complete family income range, and the same is true for the property tax. All other taxes retain basically their former patterns.

To reiterate a point already discussed, the apparent mathematical precision of the effective rates of tax should not mislead one into accepting the data as completely accurate. Given the nature of the data sources and the shifting assumptions it is natural to assume that some margin of error is involved. However, the existence of probable error in stating the effective tax rate which burdens any family





10. Social Insurance	<u>5.3</u>	<u>6.8</u>	<u>7.6</u>	<u>8.0</u>	<u>7.8</u>	<u>6.8</u>	<u>4.5</u>	<u>6.4</u>
11. Total	13.5	16.6	17.9	19.8	18.0	19.8	22.0	19.4
12. Total, Excluding Social Insurance and Lottery	7.8	9.4	9.8	11.4	9.7	12.5	16.8	12.5
13. Total, Excluding Federal Social Insurance	10.5	12.5	13.4	14.9	13.2	16.2	19.9	14.4

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Note: Details may not sum to totals due to rounding.

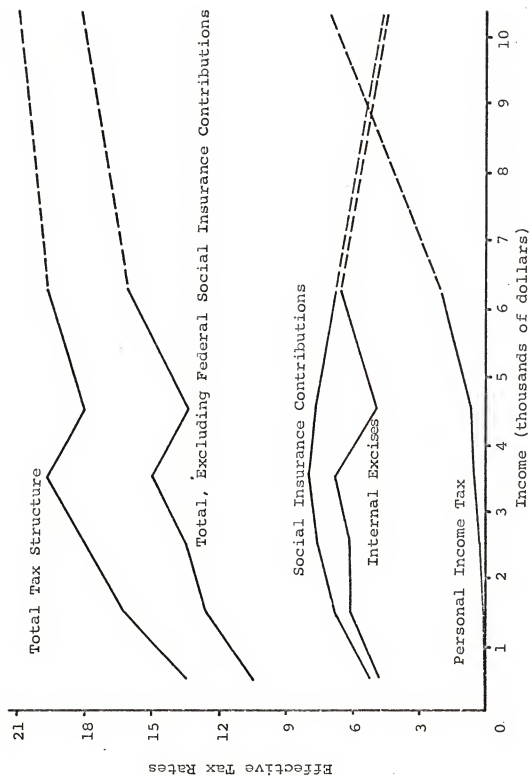
Source:

Each line of the distributions of tax payments, Table A-4, is expressed as a percentage of money and imputed income, Table A-2, Line 1.

FIGURE 3

EFFECTIVE TOTAL TAX INCIDENCE AND INCIDENCE  
OF SELECTED TAXES, PUERTO RICO, 1963  
(money and imputed income base)

Source: Table 9.



income class should not cause one to lose focus regarding the overall pattern of the burden; that is, what is really important is the relative position of each income bracket vis-à-vis the others. If, as seems reasonable, it is posited that the margin of error is randomly distributed throughout the entire family income range these relative positions--the focal point of the analysis--are not likely to be seriously affected.

## NOTES

1. Junta de Planificación, Balanza de Pagos, Puerto Rico, 1969, pp. 48-49.

2. See pages 29-35 and Table 4.

3. Merchandise export data from Junta de Planificación, Balanza de Pagos, Puerto Rico, 1969, pp. 2-3; gross domestic product data from Junta de Planificación, Negociado de Análisis Económico y Social, Ingreso y Producto, Puerto Rico, 1969, p. 1.

4. Tourist expenditure data from Junta de Planificación, Balanza de Pagos, Puerto Rico, 1969, pp. 8-9; personal consumption expenditures from Junta de Planificación, Ingreso y Producto, Puerto Rico, 1969, p. 4.

5. I. M. Labovitz, Federal Revenues and Expenditures in the Several States (Washington: The Library of Congress Legislative Reference Service, September 19, 1962).

6. Hearings before the United States-Puerto Rico Commission on the Status of Puerto Rico, Status of Puerto Rico, Economic Factors in Relation to the Status of Puerto Rico (Washington: U.S. Government Printing Office, 1966), Vol. III, p. 697. The table estimates that tax imports amounted to \$32.2 million from the corporate income tax shifted to the consumer, \$0.7 million from the corporate income tax borne by Puerto Rican shareholders, and \$24.3 million in payroll taxes shifted to the consumer.

7. Neither are federal social security contributions Commonwealth policy variables. Their inclusion, however, is not as inconsistent as may appear since the Puerto Rican government has consciously chosen to associate itself and its residents with Social Security regulations. In this sense, then, these contributions do represent Commonwealth public policy variables.

8. The empirical work that has been done in this area is limited in scope and inconclusive. For example, see T. H. Sanders, Effects of Taxation on Executives (Boston: Harvard University, 1951); R. Davidson, "Income Taxes and Incentive: The Doctor's Viewpoint," National Tax Journal, Vol. VI (September, 1953), pp. 293-297; George Break, "Income Taxes and Incentives to Work," American Economic Review, Vol. XLVII (September, 1957), pp. 529-549; J. N. Morgan, M. H. David, W. J. Cohen, and H. E. Brazer, Income and Welfare in the United States (New York: McGraw-Hill, 1962), pp. 76-77; R. Barlow, H. E. Brazer, and J. N. Morgan, Economic Behavior of the Affluent (Washington: The Brookings Institution, 1966); Michael J. Boskin, "The Negative Income Tax and the Supply of Work Effort," National Tax Journal, Vol. XX (December, 1967), pp. 353-367.

9. For a number of assumptions regarding the marginal utilities see Musgrave, Theory of Public Finance, pp. 232-246.

10. Ibid., pp. 243-246.

11. Richard Goode, "The Income Tax and the Supply of Labor," Journal of Political Economy, Vol. LVII (October, 1949), pp. 428-437; Herbert G. Grubel and David R. Edwards, "Personal Income Taxation and the Choice of Professions," Quarterly Journal of Economics, Vol. LXXVIII (February, 1964), pp. 158-163.

12. For empirical work in the area of personal income taxation and investment decisions see J. K. Butters, L. E. Thompson, and L. L. Bollinger, Effects of Taxation: Investments by Individuals (Boston: Harvard University, 1953); Barlow, Brazer, and Morgan; Norman Ture, Accelerated Depreciation in the United States (New York: National Bureau of Economic Research, 1967), pp. 95-96; R. E. Hall and D. W. Jorgenson, "Tax Policy and Investment Behavior," American Economic Review, Vol. LVII (June, 1967), pp. 391-414; the common basis of these cited sources is that they do find a definite relationship between tax policy and investment decisions. However, the Ture and the Hall-Jorgenson studies do not deal with the personal income tax but with the effect of tax credits and accelerated depreciation on business sector investment.

13. Adjusted according to the Newman procedure which is explained on pages 37-43.

14. For an excellent discussion of traditional theory and its theoretical pitfalls see Irving J. Goffman, The Burden of Canadian Taxation (Toronto: Canadian Tax Foundation, 1962), pp. 46-47.

15. For a review of this split until the late 1950s see B. U. Ratchford and P. B. Han, "The Burden of the Corporate Income Tax," National Tax Journal, Vol. X (December, 1957), pp. 310-324.

16. M. A. Adelman, "The Corporate Income Tax in the Long Run," Journal of Political Economy, Vol. LXV (April, 1957), pp. 151-157.

17. Eugene M. Lerner and Eldon S. Hendriksen, "Federal Taxes on Corporate Income and the Rate of Return on Investment in Manufacturing, 1927 to 1952," National Tax Journal, Vol. IX (September, 1956), pp. 193-202.

18. John C. Clendenin, "Effect of Corporate Income Taxes on Corporate Earnings," Taxes--The Tax Magazine, Commerce Clearing House, Vol. XXXIV (June, 1956), pp. 391-398 and 418-419.

19. Marian Krzyzaniak and Richard A. Musgrave, The Shifting of the Corporation Income Tax (Baltimore: The Johns Hopkins Press, 1963).

20. For Canada see B. G. Spencer, "The Shifting of the Corporation Income Tax in Canada," Canadian Journal of Economics, Vol. II (February, 1969), pp. 21-34. For West Germany see K. W. Roskamp, "The Shifting of Taxes on Business Income: The Case of West German Corporations," National Tax Journal, Vol. XVIII (September, 1965), pp. 247-257.

21. Richard Goode, "Rates of Return, Income Shares and Corporate Tax Incidence," and Richard Slitor, "Corporate Tax Incidence: Economic Adjustments to Differentials Under a Two-Tier Tax Structure," in Marian Krzyzaniak (ed.), Effects of Corporation Income Tax: A Symposium (Detroit: Wayne State University Press, 1966).

22. John G. Cragg, Arnold C. Harberger, and Peter Mieszkowski, "Empirical Evidence on the Incidence of the Corporation Income Tax," Journal of Political Economy, Vol. LXXV (December, 1967), pp. 811-821.



23. Robert J. Gordon, "The Incidence of the Corporation Income Tax in U.S. Manufacturing, 1925-62," American Economic Review, Vol. LVII (September, 1967), pp. 731-758.

24. For a summary of the most recent empirical work see Peter Mieszkowski, "Tax Incidence Theory: The Effects of Taxes on the Distribution of Income," Journal of Economic Literature, Vol. VII (December, 1969), pp. 1103-1124, especially pp. 1116-1120.

25. Goffman, p. 38; Gillespie (Canada), pp. 33-34.

26. One point in favor of Goffman's ratio is that it is derived from data relating to corporations alone, whereas Gillespie's relates to corporate as well as non-corporate investment.

27. See notes 1 and 2 of this chapter for sources.

28. See note 3 of this chapter for sources.

29. Departamento de Hacienda de Puerto Rico, Informe Anual del Secretario de Hacienda, 1969 (San Juan: 1969), p. 52.

30. This example is based on Musgrave-Reforma tributaria, pp. 36-37.

31. Several fairly recent studies which attempt to relate price responses to excise tax changes have little if any useful content in this theoretical setting. For example, see Harry L. Johnson, "Tax Pyramiding and the Manufacturer's Excise Tax Reduction of 1954," National Tax Journal, Vol. XVII (September, 1964), pp. 297-302; Oswald Brownlee and George L. Perry, "The Effects of the 1965 Federal Excise Tax Reductions on Price," National Tax Journal, Vol. XX (September, 1967), pp. 235-249; F. O. Woodward and Harvey Siegelman, "Effects of the 1965 Federal Excise Tax Reduction Upon the Prices of Automotive Replacement Parts," National Tax Journal, Vol. XX (September, 1967), pp. 250-257.

32. Richard A. Musgrave, "On Incidence," Journal of Political Economy, Vol. LXI (August, 1953), pp. 306-323.

33. Earl R. Rolph, The Theory of Fiscal Economics (Berkeley: University of California Press, 1954).

34. For an excellent and sympathetic review of Rolph's theory and his critics see J. M. Buchanan, Fiscal Theory and Political Economy (Chapel Hill: University of North Carolina Press, 1960), pp. 125-150.

35. Ibid., p. 142.

36. Charles McClure, "Commodity Tax Incidence in Open Economies," National Tax Journal, Vol. XVII (June, 1964), pp. 187-204; Robert H. Parks, "Theory of Tax Incidence," National Tax Journal, Vol. XIV (June, 1961), pp. 190-197.

37. Charles McClure, "The Inter-Regional Incidence of General Regional Taxes," Public Finance, Vol. XXIV (September, 1969), p. 457-484.

38. Robert A. Sigafos, Survey of Tax Incidence in Puerto Rico (San Juan: Secretary of the Treasury, 1957).

39. Ibid., p. 38. The 1962 exemption of \$15,000 on owner-occupied residences served to exacerbate this situation. An estimate of tax revenues forfeited by the Treasury due to many of these exemptions comes to almost \$22 million in fiscal year 1963. See Departamento de Hacienda de Puerto Rico, Informe Anual del Secretario de Hacienda, 1963 (San Juan: 1963), p. 18.

40. Musgrave-1948, pp. 21-23.

41. See, for example, Jens P. Jensen, Property Taxation in the United States (Chicago: University of Chicago Press, 1931), pp. 53-75.

42. Dick Netzer, Economics of the Property Tax (Washington: The Brookings Institution, 1966), pp. 34-35. Netzer refers to the Jensen study (pp. 69-75) which found strong evidence of capitalization and to the more recent Daicoff study which found little such evidence: see Darwin W. Daicoff, Capitalization of the Property Tax, University of Michigan doctoral dissertation, 1961.

43. Ibid., p. 35.

44. Since non-resident investment composes about 44 percent of total investment it is assumed that \$2.5 million of tax is exported, leaving \$3.1 million to be distributed by dividends received by residents.

45. For a discussion of some of these qualifications see Netzer, pp. 36-40.

46. Earl R. Rolph and George F. Break, Public Finance (New York: Ronald Press, 1961), pp. 342-347.

47. Raymond L. Richman, "The Incidence of Urban Real Estate Taxes Under Conditions of Static and Dynamic Equilibrium," Land Economics, Vol. XLIII (May, 1967), pp. 172-180.

48. Mieszkowski, p. 1107.

49. Since 62.9 percent of domestic product is bought in Puerto Rico only \$8.1 million is allocated by total consumption expenditures.

50. Department of Labor of Puerto Rico, Report 3.

51. As Netzer explains a separation of the land component would necessitate a division of taxes on land into three groups: (1) taxes levied when the current owners bought the sites; (2) the portion of the tax increase in past years after the current owners made the purchase; (3) the present year's tax increase, if any. The effort to arrive at such a separation would not justify the end result since the distribution of the tax burden among income classes would be very little affected. See Netzer, p. 52.

52. Harry G. Brown, The Economics of Taxation (New York: Henry Holt and Co., 1924).

53. Actually the series includes both expenditures on owned dwellings and on repairs and replacements. See Department of Labor of Puerto Rico, Report 4-A, p. 38. To this writer's knowledge there is no usable data on the value of owner-occupied residences by income class.

54. For example, it covers "machinery, vessels, instruments, or implements not attached to the building or fixed to the ground in a manner showing permanence, livestock, bonds, stock, patent-rights, trade-marks, franchises; it does not include drawing-account credits, savings accounts, promissory notes, or other personal credits." Tax Laws of Puerto Rico (Orford, New Hampshire: Equity Publishing Corporation, 1962), Title 13, Paragraph 443.

55. \$2.5 million falls on profits but 44 percent, or \$1.1 million, is exported; the remaining \$1.4 million is distributed according to dividend income. \$3.1 million falls on consumers but \$1.1 million, or 37 percent, is exported; the remaining \$2 million is distributed according to total consumption.

56. A tax incidence study done by the Puerto Rican Treasury Department for fiscal year 1968 allocates 76 percent of the property tax on the basis of total consumption, 16 percent by owner-occupied housing expenditures, and 8 percent by rental housing expenditures. One economist connected with the study told this writer that the allocations were made on the basis of no more than educated guesses. Committee on Taxation, Sub-Committee No. 1, The Tax Burden, Treasury Department of Puerto Rico mimeographed sheet dated October 17, 1969.

57. Sigafos, pp. 51-58.

58. Ibid., p. 53.

59. "The Treasury's Inheritance Tax Division faces heavy obstacles both in ferreting out property transferred by gift and in establishing accurate market values on certain types of property which are listed for tax purposes. Transfers of intangible property are escaping detection and . . . little can be done about it"; the courts accept face valuations on securities. Ibid., pp. 57-58.

60. One method of allocating the total among income brackets is to impute to a taxpayer a "death tax payment equal in amount to the premium payable on an annuity sufficient to discharge his death duty at the time of his death." Musgrave-1948, p. 25. Such an allocation would be, needless to say, quite complicated.

61. One of the most theoretically cited problems regarding transfer taxes is the "burden" of illiquidity; that is, the need to liquidate part of a business or estate to pay the tax. For example, see Rolph and Break, pp. 261-264; Harold M. Somers, "Estate Taxes and Business Mergers: The Effects of Estate Taxes on Business Structure and Practices in the United States," Journal of Finance, Vol. XIII (May, 1958), pp. 201-210. Sigafos found this problem to be of no consequence in Puerto Rico given the existence of numerous family-held corporations.

62. In calendar year 1963 motor vehicle license taxes comprise almost 84 percent of total license collections.

63. These percentages are extracted from calculations made in the excise tax incidence study of A. Gómez Vallés, El impacto de los arbitrios en la distribución del ingreso de Puerto Rico en el año 1963, University of Puerto Rico M.A. thesis, 1968. See the sources to Lines 3 and 4 of Table A-7 for an explanation of the procedure involved.

64. These difficulties have only recently been appreciated and are much more serious when a federal government structure is involved. They arise because some taxes (in the Puerto Rican context the property and municipal taxes) are administered and/or imposed by local taxing authorities but are treated as if they are equivalent in effects to an equal sum imposed by the central (federal) government. To correct the error in this study would require income and consumption distributive series for each municipality, series which are not available. Considering the highly centralized island fiscal structure such correction would not appreciably affect the end results. For an explanation of these problems see Richard A. Musgrave and Darwin W. Daicoff, "Who Pays the Michigan Taxes?", Michigan Tax Study: Staff Papers (Lansing, Michigan: 1958), pp. 131-183.

65. Musgrave-1948, p. 23.

66. This paragraph is based on ideas expounded in Musgrave-Reforma tributaria, pp. 37-38.

67. Little empirical evidence as to the burden of payroll taxes is found in the literature. The state of knowledge regarding the incidence of such taxes appears to lead to a rather agnostic viewpoint, and the proportions utilized here represent fairly "normal" allocations. A recent effort by Deran, who used Puerto Rico as her "laboratory," found that the share of property income in Commonwealth national income fell with the introduction of OASI taxes in 1951; she therefore concluded that employers bore the primary burden of the tax. See Elizabeth Deran, "Changes in Factor Income Shares Under the Social Security Tax," Review of Economics and Statistics, Vol. XLIX (November, 1967), pp. 627-630. However, Hoffman pointed out that Deran's results were based upon a misapplication of the chi-square test, and when the Deran calculations are run on the basis of more

appropriate definitions no significance is found for either a one- or two-year lag. See Ronald F. Hoffman, "Factor Shares and the Payroll Tax: A Comment," Review of Economics and Statistics, Vol. L (November, 1968), pp. 506-508. Probably the most recent attempt to quantitatively estimate the impact of employer payroll taxes on factor shares in the long run concludes that the real burden of the tax falls on labor. See John A. Brittain, "The Incidence of Social Security Payroll Taxes," American Economic Review, Vol. LXI (March, 1971), pp. 110-125.

68. The construction of the "covered" wage and salary distribution is explained in the source to Table A-1, Line 21.

69. For an explanation of this procedure see the source to Line 6 of Table A-12.

70. See Table A-4, Line 11.

71. M. O. Lorenz, "Methods of Measuring the Concentration of Wealth," American Statistical Association, Vol. IX (June, 1905), pp. 209-219.

72. Since the family money income class of "\$7,500 and over" is open-ended the effective rates within it are unknown. If the effective tax rate is higher in this class than in the immediately preceding class (\$5,000-\$7,499) it is assumed that the effective rate continues its upward "trend." On the other hand, if the effective tax rate is lower than in the preceding class the "trend" is assumed to continue downward. On this rationale the charts exhibit a dashed line after the mid-point of the "\$5,000-\$7,499" income class.

## CHAPTER IV

### THE BENEFITS OF THE PUBLIC EXPENDITURE STRUCTURE

Having discussed the distribution of the tax burden among income classes in Chapter III the analysis now turns to the other side of the budgetary scene--the distribution of public expenditures among these same family income groups. Since the stated purpose of the entire analysis is to examine the income redistributive effects of the Puerto Rican fiscal system it would be patently invalid to arrive at conclusions concerning such effects if the study were limited to the tax side alone. Taxes reduce income while these same tax revenues, when spent, serve to enhance the real incomes of individuals in the aggregate. To conclude anything about the redistribution of income without taking into account the expenditure side of the budgetary coin is to ignore the obvious interdependence of taxes and expenditures; that is, the raison d'être of taxation is to provide monies to finance public outlays. Some tax incidence studies which have reached conclusions with respect to the redistribution of income have often completely ignored ex-

penditure incidence. In such instances absolutely no logical case can be made for income redistribution unless it is implicitly assumed that expenditure benefits are distributed proportionally to income. It is, of course, possible that benefits are so distributed, but it is not expecting too much that such implicit assumptions be theoretically defended. It is to the credit of other authors of tax burden analyses that they do not purport to measure the redistributive effects of public finance and accept this limitation upon their tax burden measurements.<sup>2</sup> Thus, to be consistent with the objectives of a net fiscal burden investigation the study must necessarily analyze the distribution and incidence of those public expenditures which are reasonably allocable.

#### Expenditure Incidence Methodology

There are several alternative approaches to the distribution of public expenditures among family income classes. A first method is that labeled the "money-flow" approach by Adler, in which outlays are conceived of in an accounting sense.<sup>3</sup> Public expenditures become the source of a money flow from the polity to public employees, to firms from which it purchases goods and services, and to subsidy and interest recipients. In accordance with this approach, then, expenditures on education accrue primarily



to teachers and not to those students and student families for whom an educational system is supposedly established. Clearly such a point of departure is generally of little practical value. Moreover, as Adler observes, this concept is based on the untenable assumption that the income of public employees would be nil if they were not employed by the government. It is to be noted, nevertheless, that although the money-flow approach to expenditure distribution is rejected in the case of "exhaustive" goods and services expenditures it may be applied to transfer payments. It thus becomes analytically useful to distinguish between these two broad categories of public outlays. As Musgrave notes, the distributional consequences of transfers may be treated in a similar manner to those of taxes;<sup>4</sup> that is, they may be conceptualized as negative taxes and are thereby subject to shifting. And, needless to say, their incidence or redistributive effects are an important policy objective.

Goods and services expenditures, although causing distributional changes by affecting factor prices, differ from transfers in that their income redistribution effects are generally secondary to the process of providing general benefits by satisfying social wants. This leads to a second approach to expenditure allocation among income groups--the

benefit concept. "The benefit approach is . . . primarily concerned with . . . charging the 'cost' of certain services provided by the government to the group(s) which they are intended to benefit."<sup>5</sup> At first glance, if one assumes that the value of public goods and services is equal to their factor cost the problem of valuation of each particular service is easily resolved. Thus, if the polity spends 100 dollars on education it is postulated that students (the students' families) receive 100 dollars worth of services; it is therefore implicitly assumed that aggregate consumers' surplus is zero. However, this is a strictly objective view of the "worth" of the services. It may very well be that the subjective value of the educational services to the "benefiting" group is more or less than 100 dollars. In reality the benefit approach further subdivides into two approaches, the objective "cost of service" approach and the more subjective "benefits received" approach.<sup>6</sup>

The ideal approach to expenditure valuation would be the "benefits received" method. If each family or family income group could somehow estimate the value of the public services it receives the allocation of benefits received would be proportional to such a distribution. The problem which arises, of course, is that of revealed preferences; that is, in order to estimate the benefits received by each

individual or family it is imperative that the demand curve of that family for the particular public good be known (revealed). However, especially in the case of public goods (to which, by definition, the exclusion principle does not generally apply) preferences are not automatically revealed, in contrast to private sector output. Economic literature abounds with models attempting to resolve the problem; the Lindhal-Bowen type models fail because they blithely assume that true preferences are revealed;<sup>7</sup> the Samuelson model, although an admittedly more sophisticated attack on the same problem, also fails to resolve the conundrum while at the same time raising the additional point that the satisfaction of public wants is subject to an infinite number of Pareto optima.<sup>8</sup> These models merely serve to amplify the need to create a political mechanism which might somehow induce families to reveal their preferences. Budget determination by means of a voting process has received a great deal of attention, yet again the literature in this field appears to leave the overall revealed preference quandary in a state of suspension.<sup>9</sup>

The limitations imposed by the benefits received approach lead one to fall back upon the "cost of service" approach. It may very well be that the distributional pattern of expenditures which is derived from this methodol-

ogy varies little from that which would surface if the former methodology could be practically applied. This assumption attains more validity the greater the extent to which the demand curves of a benefiting group are alike and/or the greater the extent delineation of benefits to particular income groups is possible. Thus, the initial point of departure becomes the identification of those family income classes for which a given public disbursement is made, or, in other words, the identification of expenditure incidence. If the definition of incidence is a "change in economic position" (or the net change in the current income position) it becomes immediately obvious that these outlays (costs) enhance the real income of the beneficiary groups by making available, free of direct charge, the benefits of public services.

The range of public expenditures covers the entire spectrum from services which are not clearly allocable to specific income classes to services which are specifically allocable to fairly easily defined groups. In the former polar case the costs may be distributed according to several alternative assumptions (for example, per family, per broad income); at the other extreme the expenditures may be readily allocated among precise income groups. In between the poles are such goods as educational outlays, which

combine benefits clearly allocable to students with more general benefits allocable to society as a whole.

The first step in estimating the effective incidence of Puerto Rican public expenditures is to group the total into functional categories. This facilitates the process of making different assumptions regarding the distribution among family income classes of each subtotal. The expenditure totals by functional classification are derived principally from data provided in the budget of the Puerto Rican central government, and, with two outstanding exceptions, the functional breakdowns correspond to those defined in the introduction to the budget.<sup>10</sup> Although the data are taken from the budget they are not budgeted or projected figures but represent actual expenditures. This is the case since the 1965 budget presents actual expenditures for the fiscal year 1963 (in addition to budgeted data for fiscal year 1965); fiscal year 1964 data are extracted similarly from the 1966 budget, and the data utilized to represent calendar year 1963 are simply the mean of fiscal years 1963 and 1964.

There will exist numerous differences between the totals found in this study and those of other sources. The primary disparity lies in the fact that all outlays of the central government financed by grants from the United States

government through the Special Funds accounts are subtracted--given the goal of the investigation to analyze the redistributive effects of the Puerto Rican fiscal system; that is, wherever possible or feasible an attempt is made to isolate the Puerto Rican fiscal system from outside influences over which it has little or no control. Obviously, neither the Puerto Rican legislative nor executive branches exercise any significant control over the disposition of federal grants.<sup>11</sup> To exclude the current or operating expenditures financed by federal grants is an easy matter due to the budget's form of presentation. However, estimation is involved in the exclusion of grants for capital expenditures. (Capital outlays comprise approximately 16 to 18 percent of total central government expenditures, varying from 0 percent of total disbursements on debt interest payments to well over half of all outlays on transportation and communication.) In such cases not only the budget but other sources are consulted and a reasonable estimate is produced.<sup>12</sup> It is recognized, nevertheless, that the capital outlay totals are not precise, but this lack of exactness is not thought to be of much significance.

Expenditures for the componential parts of each classification are meticulously added from the actual current outlay data given in the budget. Each functional total

includes, by and large, only the central government grants to the various public corporations, which are generally self-financing. To gather some idea of the relative magnitudes of the financial positions of the central and municipal governments, the public corporations, the public service enterprises, and the trust funds reference is made to the following table.

TABLE 10

PUBLIC EXPENDITURE BY SOURCE, FISCAL YEARS 1963 and 1964  
(millions of dollars)

<u>Source</u>	<u>Fiscal 1963</u>	<u>Fiscal 1964</u>
Central Government	297.0	334.3
Public Corporations	270.3	310.3
Public Service Enterprises	42.3	44.2
Trust Funds	41.5	43.3
<u>Municipal Governments</u>	<u>66.8</u>	<u>91.6</u>
Total	717.9	823.7

Note: There is no double-counting. The totals for the central and municipal government expenditures differ from those of this study due to definitional distinctions.

Source:

Office of the Governor of Puerto Rico, Bureau of the Budget, work sheets.

A problem similar to that faced in calculating an exact capital outlay figure by functional classification is encountered when an attempt is made to ferret out exactly what portion of central government appropriations to public corporations is actually spent in the given fiscal year by the latter. Again recurrence is had to the budget and to annual reports of the public corporations, but what emerges is no more than a fair estimate (federal grants are excluded in this case as elsewhere).

The data for the Pensions and Social Security category are provided by the National Accounts Division of the Bureau of Economic and Social Analysis of the Puerto Rican Planning Board from its work sheets, and bear little relation to that found in the budget. Data for municipal government expenditures and public debt interest payments are taken from published material. Current and estimated capital expenditures of the two governmental levels by functional category are presented in Appendix A, where each category is further broken down into its assumed components.

Table 11 presents the expenditure totals and functional subtotals the study proposes to deal with. It is to be noted that public expenditures, in a similar fashion to taxes, may be exported in various assumed instances. The most notable case of exportation occurs in regard to



TABLE 11

TOTAL PUBLIC EXPENDITURES<sup>a</sup> BY FUNCTIONAL CATEGORY, 1963  
(millions of dollars)

<u>Functional Category</u>	<u>Central Government</u>	<u>Municipal Governments</u>	<u>Total, Both Levels</u>	<u>Total, Net of Exported Portion</u>	<u>Percent</u>
Education	116.8	0.45	117.3	117.3	24.4
Sanitation and Health	49.5	18.1	67.6	65.6	13.7
Public Welfare	18.6	-	18.6	18.6	3.9
Agriculture	18.6	-	18.6	18.6	3.9
Labor Relations	4.6	-	4.6	4.6	1.0
Transportation and Communication	32.2	4.4	36.6	32.8	6.8
Housing	8.6	-	8.6	8.6	1.8
Pensions and Social Security, Total	109.3	-	109.3	109.3	22.8
(a) Commonwealth	37.1	-	37.1	37.1	7.7
(b) OASDI Benefits	72.2	-	72.2	72.2	15.1

Interest Payments	9.1	2.5	11.6	2.1	0.4
General Expenditures <sup>b</sup>	<u>90.8</u>	<u>11.7</u>	<u>102.5</u>	<u>102.5</u>	<u>21.4</u>
Total	<u>458.1</u>	<u>37.2</u>	<u>495.3</u>	<u>480.0</u>	<u>100.0</u>
Total, Excluding OASDI	385.9	37.2	423.1	407.8	85.0

<sup>a</sup>Double-counting (intergovernmental transfers) has been eliminated with reference to transactions between the two Puerto Rican government levels. Additionally, expenditures made by central and municipal government agencies but financed by grants from the United States government have been deleted in all cases in which the data permit; this practice is consistent with the stated purpose of measuring the redistributive effects of the Puerto Rican fiscal system in isolation. It will be noted, however, that those expenditures, the benefits of which accrue to non-residents, are subtracted to arrive at the functional totals.

<sup>b</sup>General expenditures include outlays on industrial, commercial, and cooperative development, protection of persons and property, general administration, conservation and recreation. For a complete itemized list refer to Tables A-18 and A-20.

Source:

Tables A-18 and A-20.

interest payments on the public debt, a situation in which bondholders are non-residents. Additionally, certain outlays are assumed to be incurred to benefit consumers, and under these circumstances non-resident consumers may also benefit in a proportion equal to the ratio of the value of merchandise exports to the value of gross domestic product.

Expenditures on education comprise the largest proportion of total expenditures (24 percent). It should be observed that federal OASDI benefit payments are included in the total, an inclusion which serves to distort the "true" picture of Puerto Rican public spending. Given the objective of isolating the Commonwealth's fiscal system such an inclusion introduces an apparent inconsistency into the analysis. However, the rationale behind the OASDI inclusion is to be found on the tax side of the budget where federal social insurance contributions are counted as part of the overall tax burden. Therefore, it is precisely in the interest of consistency to include federal social benefit payments on the expenditure side. If it is desired to exclude OASDI payments the tabular presentations throughout the remainder of the analysis allow for this. In that case educational spending, exclusive of OASDI benefits, comprises not 24 percent but 29 percent of total expenditures.

Closely following expenditures on education in relative

importance are disbursements on pensions and social security and on general expenditures (23 percent and 21 percent respectively). Each category may be misleading to some degree and deserves further comment at this juncture. The general expenditures classification serves as a sort of depository for those outlays which appear to be analytically inallocable to any specific group or for which no valid distributive series is available; that is, it is a residual category which would not bulk as relatively large as it is if expenditure incidence theory were perhaps more highly developed or if statistical data were more readily available. With respect to pensions and social security it is immediately manifest that OASDI benefits are the major contributing factor. If OASDI payments were excluded from both total expenditures and their pertinent functional category spending on pensions and social security would amount to less than 10 percent of the aggregate.

Next in order of importance after the three above-mentioned categories are expenditures on sanitation and health (14 percent), transportation and communication (7 percent), and public welfare and agriculture (4 percent each). Eliminating OASDI benefits these proportions would be 16 percent, 8 percent, and 5 percent respectively. A striking characteristic of the Puerto Rican expendi-

ture distribution by functional category is the high proportion of spending on social welfare and human resource development. In contrast to other countries defense and foreign aid expenditures are non-existent, the explanation of course being that of the Commonwealth's particular political arrangement vis-à-vis the United States under which the island is part of a common defense network. There are no explicit defense costs to be met under Commonwealth, but the opportunity cost may be quite substantial when it is taken into account that the federal defense establishment occupies large land areas and that the Puerto Rican male is subject to the draft. But such a discussion is beyond the scope of this study.<sup>13</sup>

#### Allocation of Expenditures on Education

Expenditure on education is proportionally the most important Commonwealth functional outlay category. The \$117.3 million spent on education in 1963 comprises almost one-quarter of total expenditures, by far the greater share being spent by the central government. The agency responsible for administering the public school system below the university level is the Puerto Rican Department of Education, while the University of Puerto Rico, the island's sole public institution of higher learning, is in charge of its two main campuses.

Given the adoption of the "cost of service" methodology the task is to allocate expenditures by the beneficiary groups. Certainly it would be outrightly assumed that the beneficiaries in this case are the students who receive the instruction; this assumption is followed up to a point, but since this analysis deals with family income groups it becomes imperative to posit that the costs supposedly incurred on students' behalf are transferred to the families of the students. When this is done the pertinent costs are distributed according to the family income distribution of students. However, a departure will be made from the preferred methodology to attempt to allow for the externalities occasioned by spending on education; that is, some of the expenditures are assumed to benefit not only those on whose behalf costs are undertaken but the whole of Puerto Rican society. Such a methodological deviation is quite defensible theoretically, for there is little doubt that society benefits from the existence of a literate population; it is much less defensible empirically because there is no manner of determining the magnitude of the "general" benefits. Nevertheless, it is arbitrarily assumed that 25 percent of the total (\$29.2 million) is allocated to externalities and is distributed on a per capita (per family) basis. The remaining 75 percent is then distributed, with a minor

exception, among students according to the family income class to which they belong.

It would be possible, but perhaps not practical, to further depart from a "cost of service" approach. Education expenditure may be conceived of as investment in human capital.<sup>14</sup> As a result of such investment the student's expected lifetime income ordinarily increases directly with the educational level he has attained.<sup>15</sup> Becker, for example, finds the return on investment in higher education comparable to that in business.<sup>16</sup> Numerous studies have been done in this field, but all appear to entail certain defects. Among these one encounters the use of current cross-section data to predict future time series, the question of whether income reflects marginal productivity well enough to be used as an estimate of social returns, and the fact that income is dependent on variables besides education and age; the latter defect conjures up all the complications of multivariate statistical analysis.<sup>17</sup> A recently developed model to predict lifetime earnings appears to overcome some of the major difficulties associated with this type of analysis.<sup>18</sup> Nevertheless, the development and/or use of such a model is beyond the scope of this study and recurrence is had to the already described "cost" approach.

In order to distribute those expenditures postulated to have been incurred on behalf of students (the family income class in which they fall) it would ideally be best to secure a breakdown of costs between elementary school (grades 1-6), junior high school (grades 7-9), and senior high school (grades 10-12).<sup>19</sup> This is the case since, as data reveal, expenditure per student is higher at each successive level.<sup>20</sup> Moreover, not all students pass through all levels.<sup>21</sup> Additionally, the procedure would necessitate an income distribution of students' families for each level. However, the ideal is not feasible in the Puerto Rican case since only a cost breakdown between levels and an estimate of students expected to complete each level of education are calculable, whereas the available distributive series relate solely to the university and non-university levels. Given this data gap the study is forced to lump all pre-university students (grades 1-12) together and distribute the relevant expenditures among them; similarly, university students are treated as one group.

The \$64.28 million spent on public education at the pre-university level is allocated among family income classes by a series derived from a study carried out in March and April of 1962.<sup>22</sup> Since the students in grades 1-3 are not included in the sample the derived distribution



probably contains a bias against the lower income groups, for it is precisely the children of these families who experience the highest dropout rate. The data are presented separately for urban and rural school children so that the percentage distribution employed is the result of weighting. Besides the exclusion of grades 1-3 in the raw data there exists another perhaps more serious statistical deficiency. The family income brackets are given on a monthly income basis and are multiplied by a factor of 12 to put them on an annual basis as required by this study. To the extent that family income is not subject to large monthly or seasonal fluctuations over the span of a year this procedure is justifiable; it is, of course, impossible to verify the degree of error introduced. Moreover, the source income groups are adjusted by linear interpolation to make them correspond to the family income brackets utilized here. Each one of these adjustments introduces a degree of error which is inescapable given the nature of the original source. Reference should be made to Table A-1 for the adjustment procedures and the final distribution.

The distributive series used to allocate expenditures of \$20.68 million on university education is developed from a study undertaken in April and May of 1961.<sup>23</sup> Ideally this family income distribution of university students should be

updated to 1963 by a process of extrapolation, but is impossible due to the lack of a comparable family and family income distribution for 1961.<sup>24</sup> The study sample includes only first-year students and may thereby contain a bias toward the lower income brackets since students from such families may not complete their degrees due to family financial problems or due to their socioeconomic backgrounds. As is the case with the pre-university distributive series the raw data undergo various adjustments because their presentation is by monthly income levels and the income brackets are not analogous. So that once again it is concluded that the resultant series may be merely a rough approximation to the "true" series. Appendix table A-1 explains the adjustments undertaken and the weights used.

Analysis of the Department of Education budget and of the componential items of the educational expenditure functional category leads to an estimate of \$2.64 million spent on adult education programs. Most of these programs are directed toward those adults who desire to continue their education at all levels--elementary, intermediate, and secondary. Based on the assumption that there exists a high correlation between low family income levels and the amount of education acquired by either the family head or other family members of employable age or skills the total is

allocated by a percentage distribution of families in the three lowest income brackets. The insignificant amount expended by the municipalities on educational activities (\$0.45 million) is distributed according to the total number of families.

To this juncture no mention has been made of possible exportation of education expenditures. A relatively small number of non-Puerto Rican residents are students at the public university, and to the degree that public expenditures are assumed to be undertaken on behalf of students, exportation occurs. However, no allowance is made for these students, as such an adjustment would be very small. Exportation might also take effect with respect to the 25 percent external benefits postulated as accruing to society at large. Emigration of students from Puerto Rico during 1963 would reduce the aggregate external benefits accruing to society;<sup>25</sup> as before, no allowance is made for such a "brain drain."<sup>26</sup>

#### Allocation of Expenditures on Health and Sanitation

Public expenditure on health and sanitation, as expenditure on public education, represents investment in human capital. In the developed countries such investment appears to have been a factor leading to economic growth, given that real production has experienced a greater growth

rate than have fixed capital investment and the total labor force.<sup>27</sup> As Ramírez Pérez notes this may not be valid in the Puerto Rican case due to certain structural and institutional limitations.<sup>28</sup> Firstly, the underdeveloped state of the economy necessitated a large fixed capital investment in order that the industrialization program might succeed. Secondly, maximum use of human capital and the subsequent attainment of maximum real production are impeded due to large-scale unemployment. However correct these observations may be the state of public health has received top priority in the establishment of Commonwealth social policy, and public spending in this area has undoubtedly contributed to the general welfare.

For analytical purposes the expenditures of the central government (\$49.5 million gross of the exported portion) are divided into four categories:

(1) Expenditures of the Puerto Rican Department of Health. The programs carried out by this agency are mainly curative in nature in contrast to the preventive nature of state programs in the United States;<sup>29</sup>

(2) The school lunch program--comedores escolares--under which public school students receive a free meal;

(3) Outlays on sanitation consisting of appropriations for operating and capital expenses made to the Aqueduct and Sewer Authority, a public corporation;

(4) Expenditures on hospital construction.

Health Department outlays are subdivided into two categories, those assumed beneficial to all families and those beneficial to lower income groups alone.<sup>30</sup> The function of those expenditures in the former category are preventive in nature and may therefore be conceptualized as pure public goods. In this sense spending is assumed to benefit families independently of their income; that is, the services financed by these expenditures are consumed in equal quantities by the general public. As an example, anti-polio inoculations not only reduce the propensity of the recipient to contract the virus but also decrease the probability that non-recipients might contract it. After examination of the Health Department's budget 40 percent of its current outlays (\$13.24 million) are assigned to this classification and are distributed according to a percentage distribution of the total number of families since, as postulated, they are incurred on behalf of society as a single entity. The remaining 60 percent (\$19.77 million) of the aggregate generally represents current expenditure on public hospitals and health clinics, and is incurred on behalf of hospital and clinic patients. This amount would ideally be distributed according to a distribution by income class of patients at each type of facility. Although such a series is

apparently non-existent at present there do exist data which permit defensible allocations to be made.

The percentage of the population dependent on public health services was set at 67 percent in 1958.<sup>31</sup> An island-wide family survey taken during the years 1958-1960 reveals a great deal about the socioeconomic characteristics of the users of public health facilities.<sup>32</sup> The interviewed families were distributed into three groups (I, II, and III), the former being the highest group in terms of income levels and scholastic achievement, the latter (III) being the poorest group with the least education and income, and the middle group falling between the extremes. Of the total number of individuals hospitalized from Group I only 14 percent were cared for in public hospitals, while the corresponding percentage for Group III was 77 percent. Moreover, the 23 percent from Group III who were treated in private hospitals paid little if any of the cost, being beneficiaries of the Veterans Administration or having Blue Cross coverage. Public facilities provided free physician care for 13.5 percent of Group I patients, 44 percent of Group II patients, and 75 percent of Group III patients. Excluding physician payments out-of-pocket costs for hospital care were not incurred by 36 percent, 75 percent, and 92 percent of Group I, II, and III patients respectively. These data

appear to be sufficient to support the contention that expenditure on public hospitals and clinics is incurred on behalf of patients drawn largely from the lower income classes. Consequently, these outlays are allocated to the family income classes below \$7,500 in proportion to a percentage distribution of the reciprocal of average broad family income.<sup>33</sup> This is consistent with the observation of Ramírez Pérez that public policy has given priority in health spending to the indigent population.<sup>34</sup>

The school lunch program offers a free lunch to approximately 40 percent of the students enrolled in public schools (at the pre-university level).<sup>35</sup> Any child may receive the lunch by simply soliciting it; that is, no means test is applicable. Given that receipt of the service is independent of family income the \$7.67 million spent by the government is distributed according to the percentage distribution of the number of children enrolled in public schools, the assumption of distributional neutrality being implicit; some bias toward the higher income classes might be expected to result from the use of this series since a greater proportion of such families may choose to feed their own progeny.

Appropriations to the Aqueduct and Sewer Authority are broken down into three parts. One-eighth of the total

(\$0.77 million) is allocated equally to the two lowest family income brackets since this amount is specifically appropriated for water service in poor and/or rural communities. The remainder, \$5.35 million, consisting principally of capital expenditures on waste disposal and water provision, is allocated between the business and residential sectors in a 50:50 proportion.<sup>36</sup> The residential portion of \$2.7 million represents costs incurred on behalf of the occupants of homes or apartments (owned, rented, or freely provided) and is allocated by a distributive series which is the weighted average of the number of families by income class residing in owner-occupied, renter-occupied, and freely-occupied dwellings.<sup>37</sup> It is assumed that the costs allocated to the business sector are shifted forward to the consumer; this is merely the reverse of the theoretical argument which shifted the excise tax burden completely to the consumer. As a result, the benefits received by the business sector are transferred to consumers and the total is allocated according to the distribution of total consumption expenditures. Only \$1.7 million is distributed, however, since allowance is made for the exported portion; that is, the 37.1 percent of the cost incurred on behalf of non-resident consumers.

Finally, the \$2.7 million of capital outlays on



hospital construction is distributed according to the reciprocal of per family broad income. The rationale behind this procedure is the same as that supporting the allocation of expenditures on public hospitals and clinics--that public hospitals are in general attended by lower income family members.

In contrast to all other functional expenditure classifications municipal spending on health and sanitation is of relative import, comprising 27 percent of total spending on this category in 1963. Outlays on sanitation consist primarily of garbage collection and street cleaning, and the total of \$5.54 million expended on this function is divided equally between the residential and business sectors as is done above with respect to central government disbursements on sanitation. Allocation among income groups is equally similar; that is, \$2.77 million corresponding to the residential sector is allocated by a weighted average of the number of families living in owner-occupied, renter-occupied, and freely-occupied residences. \$1.74 million corresponding to the business sector is distributed according to total consumption after subtracting the exported share.

Among the foremost of the responsibilities of the 76 municipalities is the provision of medical care to low-

income persons.<sup>38</sup> Each town has its own medical care program, with dispensary services in the smallest to medical and hospital services in the largest. The health center is the basic unit of municipal activity in the health service area, offering comprehensive public health, public welfare, and hospital services. These centers are operated under an annually renewable agreement between the Department of Health and the municipality, each party contributing about 50 percent of the operating costs of the hospital unit of the center. The expenses of the public health and welfare units are met solely by the central government. In addition to the payments of half the current expenses of the hospital units the major portion of the remaining municipal expenditures go to the purchase of drugs and medicines. Of total municipal outlays on health care of \$12.6 million 40 percent (\$5.04 million) is assumed to be available for public consumption in equal amounts and is distributed by the total number of families; 60 percent (\$7.56 million) is assumed to be spent on facilities patronized principally by low-income families and is distributed by the reciprocal of average broad income. These allocations and distributions are exactly analogous to those made on Health Department outlays, and the theoretical rationale is precisely identical.

Allocation of Expenditures on Public Welfare

By far the largest portion of expenditures on public welfare is disbursed by the Division of Public Welfare of the Department of Health.<sup>39</sup> The Division's functions may be conveniently broken down into five categories: (1) aid to the elderly--attainment of age 65 is the most essential factor for receiving benefits under this subprogram although the aid solicitant must meet a bevy of means tests in order to qualify;<sup>40</sup> (2) aid to children under 18 years of age whose parents are not able to support them; (3) aid to the handicapped, including the blind; (4) a food distribution program which apportions foods donated by the U.S. Department of Agriculture. The Division pays only the administrative expenses of this program which distributed surplus foods worth approximately \$20 million to over 100,000 families in 1963; (5) general public assistance, in monetary terms comprising almost 60 percent of the Division's outlays. This subprogram provides direct money payments on a regular basis and on an emergency basis to those who qualify. Qualification depends on a variety of means tests not necessarily directly related to income in the past or future, but related to what the Division defines as a lack of sufficient income or resources to cover minimum necessities.<sup>41</sup> After investigation determines the amount

of money needed to affront these basic needs credits are offered which cover some 40 to 45 percent only of the person's requirements; this gap remains unfilled because the agency itself lacks adequate financial resources.

Also classified under public welfare are outlays on central government grants to the Manpower Development Administration and to the Urban Renewal and Housing Corporation, both of which are public corporations. The former carries the responsibility of training and providing employment for the unemployed in the areas of agriculture, public works, and recreational facilities; the latter, engaged in the provision of low-rent housing, receives these particular grants in order to pay for water in public housing projects.

It is assumed that expenditures on public welfare are incurred on behalf of the recipient individuals and/or families and are allocated by the distributive series "Public Assistance and Private Charity."<sup>42</sup> This series includes cash received from both public and private relief agencies, including aid to the aged, blind, and other handicapped, but excludes the money value of food, clothing, or other commodities received. Thus, it does not quite correspond to the total to be distributed but it nevertheless appears relevant and appropriate. As would naturally be

assumed low-income families should be the beneficiaries of such spending, and the data support this hypothesis by allocating 72 percent of the given total to families with incomes less than \$2,000, and 95 percent to families in the income classes up to \$3,000.<sup>43</sup>

#### Allocation of Expenditures on Agriculture

Public expenditure on agricultural development is wholly a central government function. Aggregate Commonwealth outlays on this category are subdivided into two broad aspects: (1) administrative and research expenses and (2) expenses on subsidies and on marketing and production services. The following table offers a breakdown of the two groupings:

TABLE 12

BREAKDOWN OF COMMONWEALTH AGRICULTURAL EXPENDITURES, 1963  
(millions of dollars)

<u>Item</u>	<u>Administration and Research</u>	<u>Subsidies, Marketing, and Production</u>
Agricultural Council	0.138	
Agriculture Department	1.672	4.562
Sugar Board	0.141	
Experimental Station-Río Piedras	2.202	
Extension Service	0.571	0.571
Coffee Subsidies		2.125
Appropriations to Land Authority	0.889	0.889
Agricultural Credit		1.324
Water Resources Authority		0.347
Experimental Station-Mayagüez	0.058	

TABLE 12 continued

<u>Item</u>	<u>Administration and Research</u>	<u>Subsidies, Marketing, and Production</u>
Capital Outlays		1.800
<u>Rural Electrification</u>		<u>1.245</u>
Total	5.671	12.863
Percentage Distribution	31	69

Source: Table A-19

Expenditures on research and administration are incurred on behalf of the agricultural community as a whole;<sup>44</sup> that is, they are assumed to be invariable among agricultural family income classes since it is most probable that all farmers benefit similarly. Given the postulate that the cost of these services does not fluctuate as farm family income varies, the \$5.67 million is allocated by a distribution of farm families by income class.

The distribution of farm families by income bracket is developed especially to allocate the above research and administrative expense total. Although it does not correspond precisely to the concept of farm families it is apparently the best known alternative from available source material.<sup>45</sup>

TABLE 13

## DISTRIBUTION OF FARM FAMILIES BY INCOME CLASS, 1963

<u>Family Money</u> <u>Income Class</u>	<u>Number of Families</u>	<u>Percentage Distribution</u>
Less than \$1,000	20,000	26.0
\$1,000-\$1,999	34,880	45.3
\$2,000-\$2,999	10,700	13.9
\$3,000-\$3,999	4,300	5.6
\$4,000-\$4,999	2,000	2.6
\$5,000-\$7,499	2,920	3.8
<u>\$7,500 and over</u>	<u>2,300</u>	<u>3.0</u>
Total	77,100	100

## Source:

Adapted from Department of Labor of Puerto Rico, Income and Expenditures of the Families, Puerto Rico, 1963, Report 1-A, Income of All Families (San Juan: February, 1967), p. 78.

What is actually given in the source is a percentage distribution of families by income group and the industry in which the family head worked. In this case the "industry" is defined as agriculture, forestry, and fishing. Although the industry classification is a bit broader than agriculture alone there is no doubt that the overwhelming majority of family heads are engaged in farming activities since both forestry and fishing are of negligible importance in terms of total full-time employment.<sup>46</sup> It will be noted that unattached individuals are not included in this distribution for the reason that there exists no corresponding source relating to them; it would be expected that their

inclusion would weigh the family distribution more toward the lower income classes since their average monetary income is \$1,447 and 15.7 percent derive their livelihood from agricultural pursuits.<sup>47</sup>

The principal intent of expenditure on production and marketing services is to lower per unit production costs and improve marketing efficiency. To the extent such intentions are successful it might be assumed that the consumer benefits from these outlays, and the cost would be distributed according to consumer expenditure on farm products. Such an assumption is reasonable if conditions of perfect competition reign in both factor and product markets, and implicit in the competitive assumption is that full employment is a reality.<sup>48</sup> It does not seem realistic to posit either the explicit or implicit assumption in the case of Puerto Rican agriculture.<sup>49</sup> Accordingly, subsidy payments and production and marketing costs are assumed to be incurred on behalf of farmers and are allocated by a distribution of farm income; the rationale behind such an allocation is that these services and subsidies are distributed on the basis of the physical volume of farm output (or the value pertaining to the physical output). It is to be observed that capital outlays on agriculture are assigned in their entirety to this category, as are capital and current



outlays on the provision of rural electrification. Although it is not supposed that all rural families are at the same time farm families, this allocation is nonetheless questionable. However, it is hypothesized that a relatively large portion of spending for rural electrification benefits farm families, and, rather than attempt a percentage distribution, all rural electrification costs are assumed to be incurred on behalf of farm families.

One factor of note is that direct public subsidies to agriculture are not as relatively important on the Puerto Rican scene as in the United States. In the breakdown of Commonwealth agricultural expenditures offered in Table 12 the only apparent subsidy is to coffee producers; these subsidies are given to coffee exporters by the Economic Stabilization Administration to stabilize internal coffee prices. There are other subsidies given, however, which are "hidden" in the outlays of the Department of Agriculture; these "incentive payments," made for new sugarcane seedings, pasture development, fertilizer distribution to tobacco producers, and more efficient coffee production practices, comprise approximately half of Department spending catalogued above under subsidies, marketing, and production. Nevertheless, of expenditures on the agricultural sector financed and carried out by the Puerto Rican government

alone subsidies cum price supports do not form the heart of the program. Of course, one explanation for this is the existence of federal transfers to agriculture, an outstanding example being the 1.1 million ton sugar quota entrance to the U.S. market. But, for analytical consistency, such transfers are not considered here.

As already stated expenditure on marketing, production, and subsidies is distributed in proportion to farm family income. Due to the apparent lack of the required series it becomes necessary to develop one, a process which incurs an unspecified degree of error. The data used to derive the distribution of farm families by income bracket are not utilizable for this purpose, so that recourse is had to a roundabout procedure. These results are contained in Table 14.

A farm family monetary income distribution is estimated from data presented on the distribution of income of rural families (column 3). Farm families represent only a fraction of total rural families (32 percent), but it is assumed that rural family income is distributed in more or less the same fashion as is farm family income. Income in kind data (column 4) are also derived from a distribution of all rural families, and are added to monetary income to yield a total income estimate; the percentage distribution of this total

TABLE 14  
DISTRIBUTION OF FARM FAMILY INCOME BY INCOME CLASS, 1963  
(incomes in millions of dollars)

Family Money Income Class	(1) Number of Families	(2) Percentage Distribution	(3) Monetary Income	(4) Income in Kind	(5) Total Income	(6) Percentage Distribution
Less than \$1,000	20,000	26.0	36.2	7.6	43.8	7.7
\$1,000-\$1,999	34,880	45.3	118.2	14.2	132.4	23.2
\$2,000-\$2,999	10,700	13.9	128.0	3.6	131.6	23.1
\$3,000-\$3,999	4,300	5.6	76.1	1.3	77.4	13.6
\$4,000-\$4,999	2,000	2.6	49.7	1.0	50.7	8.9
\$5,000-\$7,499	2,920	3.8	66.4	1.8	68.2	12.0
<u>\$7,500 and over</u>	<u>2,300</u>	<u>3.0</u>	<u>64.8</u>	<u>1.1</u>	<u>65.9</u>	<u>11.6</u>
Total	77,100	100.0	539.4	30.6	570.0	100.0

Sources:

Columns (1) and (2) from Table 13; Column (3) adapted from Department of Labor of Puerto Rico, Income and Expenditures of the Families, Puerto Rico, 1963, Report 1-A, Income of All Families (San Juan: February, 1967), p. 6; Column (4) adapted from Ibid., Report 2, Family Income by Source of Income (San Juan: June, 1967), p. 51.

(column 6) is the distributive series representing farm income.

Allocation of Expenditures on Labor Relations

The \$4.6 million expended on labor relations, comprising slightly less than 1 percent of total public expenditures, represents spending by the Department of Labor and the Board of Labor Relations. The former agency develops and carries out public policy with respect to employment and working conditions, labor-management relations, hour and wage standards, the compilation of statistical data relating to labor activities, and labor training programs;<sup>50</sup> the latter is a quasi-judicial organism that exercises jurisdiction over labor-management relations in agriculture, in the public corporations, and in commercial enterprises not covered by federal statutes.<sup>51</sup>

In terms of importance within the Department of Labor (importance as measured by monetary disbursements) the Migration Division of the Bureau of Employment Security is particularly outstanding. Its duties are carried out primarily in different cities in the United States and are directed toward orienting and helping the Puerto Rican to adapt to living and working conditions on the mainland. It might be assumed that most of these outlays are exported since they are made in favor of non-resident Puerto Ricans;

nevertheless, this procedure is not followed, for it may be rationalized that such costs eventually serve to augment the level of skills of the resident worker either by means of return migration of the aided laborer himself or transmittal of knowledge to those who do return.<sup>52</sup>

The total expenditures of the Labor Department and the Labor Relations Board are allocated according to a distribution of wages and salaries. Conceivably the distributive series utilized might have been some form of income base or a percentage distribution of all families on the supposition that society as a whole benefits from greater labor productivity. However, it appears more valid to postulate that the "cost" of labor relations is incurred on behalf of wage and salary earners, although it is granted that employers may also reap certain benefits if, for example, the Labor Department is instrumental in preventing strikes.

Allocation of Expenditures on Transportation  
and Communication

Of the total central and municipal government expenditures of \$36.6 million on transportation and communication approximately 95 percent represents spending on highway maintenance and construction. The focal point of this section is therefore upon an analysis of highway outlays to the almost complete neglect of other spending. The methodology utilized depends largely on that developed by

Gillespie in his United States and Canadian studies, the lack of originality being due to the dearth of usable Puerto Rican data and pertinent studies on highway economics.<sup>53</sup>

Highways serve three rather distinct purposes. Firstly, they provide access to land in both urban and rural areas without which the land would be of little or no value. Secondly, they perform what is termed a community service function, although this second function is not entirely separable from the access to property function. In this capacity "roads provide for the local movement of persons and property in the performance of the processes of production, marketing, buying supplies, going to school, and carrying on numerous social and other activities."<sup>54</sup> Thirdly, roads and streets (highways, roads, and streets are used synonymously in this discussion) provide an avenue of intercommunity mobility and long-distance transportation for commercial, recreational, and defense purposes.<sup>55</sup>

Given the overlapping nature of the first two functions, and following the "cost of service" approach to the measurement of expenditure incidence, highway expenditures are assumed to benefit two distinct and separable groups of individuals--highway users and non-highway users. The former consist of those persons who receive benefits generated through the use of passenger cars, buses, and trucks;

the latter consist of those whose benefits arise out of the property access value provided by the public byways. Thus, analytical considerations necessitate a determination of the responsibility for total highway costs between users and non-users.

A number of different methods have been advanced to attempt the required allocation.<sup>56</sup> Although each contains analytical and/or empirical defects the studies in which they are employed have presented sufficiently similar evidence to permit a tentative 25 percent allocation of total highway costs to non-highway users. Despite the fact that the estimates apply to experience in the United States and that they rest on rather shaky underpinnings they offer what appears to be the best separation of highway outlays known or available to date. To the extent that Puerto Rican roads are similar in design, construction, and maintenance characteristics to those in the continental United States, and to the degree that island resident travel patterns simulate those in the U.S. the adoption of the 75-25 split may be feasible in the island's case. There is reason to believe that to some degree the Commonwealth road system is similar to that on the continent since qualification for federal highway grants depends on the fulfillment of certain standards; moreover, complaints have

been voiced on precisely this point; that is, that those standards applicable in the U.S. should not be appropriate to a semi-tropical country. But this is beside the point, for there remains no alternative to accepting the given results other than blind supposition.

The 25 percent assumed to benefit non-highway users should ideally be distributed according to the value of owned-property since the costs are posited to be incurred on behalf of those who hold property. Such a distributive series is not available, and an approximation is made to it by employing a substitute series--taxes paid on residential property. Discounting the 15,000 dollar property tax exemption on owner-occupied residences, which weights the series toward the higher family income classes, if it can be assumed that the value of owned-homes is fairly proportional to the value of owned-land then the series approaches the more ideal value of owned-property. Naturally, it is awkward to assume away the effects of the tax exemption but no other recourse remains open.

Mention might be made of the Brownlee approach to highway expenditure distribution.<sup>57</sup> Two points merit attention. First of all, he dismisses the value of access to property as too small a portion of the total to deal with, and consequently allocates outlays to highway users; his



decision to do so does not appear to be based on empirical evidence. In the second place he maintains that additions to a highway system in a given year provide services in future years, and therefore capital spending for new construction should not be allocated to the current year. Accordingly, he credits only 5 percent of capital expenditures to the year under study and 95 percent to future years. This proposition, although perhaps analytically defensible, is not accepted, and all capital expenditures made on Puerto Rican highways in calendar year 1963 are credited in totality to that year. The procedure would involve an arbitrary decision as to the longevity of varying types of roads; moreover, it would seem to require imputations to the current year of capital expenditures from a series of previous years. Even if these doubts could be empirically resolved--which is uncertain--little might be gained.

Returning to the mainstream of the discussion it is necessary to determine the allocation of those costs (75 percent of total highway expenditures) incurred on behalf of highway users. By highway users is meant basically two types of vehicles--passenger cars and trucks--related to owners of private automobiles and to consumers of those goods transported by truck carriers. Buses provide services or benefits similar to autos and are lumped together with

them. Highway maintenance, improvement, and construction clearly benefit the owner of an automobile by reducing his operating and repair expenses; in this fashion the expenditure "burden" falls directly on the individual and is not appropriated (shifted) to others. Hence it can be surmised that a portion of highway spending is incurred on the behalf of individuals or families which "consume" road services by means of travel. What now arises is the necessity to inquire into the matter of that share of the highway user cost consumed by passenger cars in opposition to trucks.

The Department of Commerce Cost Allocation Study recognizes four different methods of allocating costs among highway users (cars and trucks for purposes of this study).<sup>58</sup> It favors as the most feasible approach a method which uses gross ton-miles as the estimate of cost responsibility, but does not recommend it as a sole solution to the problem. A second approach, the "cost-function method," separates costs into three categories: (1) costs variable with highway usage; (2) costs independent of vehicle size and traffic volume; (3) costs dependent upon vehicle size or weight. The third approach, the "relative use method," allocates costs according to benefits derived from highway use by each class of vehicle on the assumption of joint costs. The fourth approach, the "incremental cost

method," received the approbation of a later study on highway cost responsibility due to its apparently sounder foundation in highway engineering research.<sup>59</sup> Despite its more acceptable base it remains analytically difficult to define incremental costs, because highway costing involves the problem of joint products and common costs; that is, both cars and trucks use the same facilities. The difficulty becomes especially acute if the service provided is consumed (used) in fairly equal amounts by varying classes of consumers. In order to resolve the quandary posed by point costs, expenditures are separated into "basic" and "special" costs;<sup>60</sup> the former consists of those outlays required to provide access roads to properties and those needed to provide a road strong enough to carry a normal load of light traffic; the latter entail those expenditures necessary to provide roads and road surfaces for heavily used byways which at the same time are subject to use by increasingly weightier vehicles. Each ascending axle-weight class calls forth further cost increments which are then assigned to those vehicles which are causal in the marginal cost rises. All basic costs above access costs (which, as stated above, are attributable to property owners) are allocated to light vehicles; the remaining joint costs are distributed according to total vehicle mileage by type of vehicle, vehicle mileage assumed to reflect road system usage.

Empirical estimates of the distribution of highway user cost between cars and trucks vary from a car to truck ratio of 68:32 to 47:53; the Gillespie seven-study average yields a 56:44 ratio.<sup>61</sup> Brownlee estimates, on a weight-distance basis, a 57:43 proportion.<sup>62</sup> The ratio to be used here squares well with the above evaluations; it is based simply on the ratio of the number of gallons of gasoline consumed by private cars to the total number of gallons consumed.<sup>63</sup> Its value yields a 60:40 division of highway user cost between cars and trucks, and is founded upon the rather tenable assumption that gasoline consumption is a fair measure of the extent of highway use.<sup>64</sup>

The 60 percent share (\$15.32 million) allocated to consumers of passenger travel by private auto is distributed according to family expenditures on automobile operation (the series is actually labeled "Auto Operating Expenses"). The series includes spending on gasoline and "other operating expenses," the latter remaining undefined; both outlays are assumed to approximate private utilization of highways. That portion of the benefit accruing to non-residents is not computed and is most likely not of great import; to the extent that this omission matters the result is an overstatement of expenditure benefits.

Turning finally to the 40 percent user share allocated

to trucks used as transports (\$10.22 million) it is assumed that these expenditures are incurred on behalf of consumers of transported goods. If it can be reasonably assumed that excise taxes are shifted forward to the consumer it may conversely be assumed that cost reductions in the trucking industry brought about by better or newer roads are also passed on to the consumer. In this manner consumers of transported goods benefit from road outlays, and consequently the truck user share is distributed by a specially developed series entitled "Expenditures on Transported Goods."<sup>65</sup> Only a total of \$6.43 million is distributed, however, since allowance is made for the exported portion, the share of expenditure benefits accruing to non-resident consumers of transported goods. The exported part consists of the proportion of merchandise exports to gross domestic product.

There remains the relatively insignificant outlays on other modes of transportation (\$1 million) and on communications (\$1.53 million). Other transportation spending goes principally to maintain and construct air terminals and to the provision of port facilities; these expenditures are assumed to be incurred on behalf of air and marine passengers and consumers of transported goods. The rationale behind the latter beneficiaries is simply that business

makes use of available facilities, use which results in cost reductions passed on to consumers. Other transportation expenditures are therefore divided equally, one-half distributed according to expenditures on air and other transportation and one-half allocated by the expenditure on transported products series. Expenditures on communications, which consist of grants to the Communications Authority (a public corporation) for the provision of telegraph and telephone services, are distributed according to an expenditure on telephone and telegraph series.

#### Allocation of Expenditures on Public Housing

Public expenditures on housing are comprised principally of central government grants to the Urban Renewal and Housing Corporation<sup>66</sup> and funds allocated to the Social Programs Administration of the Department of Agriculture. The former, a public corporation, develops public housing programs in urban areas and has two basic functions: the construction of low-cost housing for low-income families and the elimination or rehabilitation of slum areas. The latter promotes the resettling of low-income families in rural areas, the construction of housing through mutual aid and self-help projects, and the construction of capital improvements in rural communities.

If it is assumed that public housing replaces slum

housing then income redistribution affects the various involved groups in different ways.<sup>67</sup> The slum landlord loses income if it is hypothesized that he purchases public housing bonds with the condemnation awards he receives, for his net income is further decreased because the increased taxes to pay for the subsidy force down the interest rate on tax exempt bonds. The low-income occupants gain, as they pay less than the housing units are worth; the taxpayer loses (it is assumed that the low-income families pay little or no tax) since taxes are increased to cover the annual contribution and the administrative costs of the public housing authority. Even if the public housing occupants pay taxes, increases in personal income taxes come more from higher income classes than lower income classes since the tax is progressive.

Rothenberg attacks the problem from a different angle, defining three types of benefits (or impacts) arising out of urban renewal projects in slum areas;<sup>68</sup> (1) improved resource efficiency through internalizing market externalities; that is, improved resource allocation is brought about by a new sense of community cohesion created through common ownership of the entire site. Whereas prior to a renewal project the lack of coordination led each slum resident to act alone in a manner resulting in suboptimal land use

public ownership leads to a social gain measured by an increase in the total site value of the area;<sup>69</sup> (2) "differential real income effects according to location, income level, owner-tenant status, and functional classification of property, as a result of changes in numbers and location of housing units and commercial and industrial property";<sup>70</sup> (3) reduction in social costs due to decreased probabilities of crime, fire hazards, health problems, and personality and social adjustment difficulties.

Instead of quantifying the gains and losses of different groups due to public housing expenditure, and despite the methodology developed by Rothenberg, recurrence is had to a much simpler approach. It is assumed that these costs are incurred on behalf of low-income families, and the total is allocated by a distribution of families in the three lowest income classes (below \$3,000). Eligibility for admission to and continued residence in public housing units depends on family income and size; in 1963 a family of three with an income of less than \$2,000 was admitted, and was permitted to remain if family income did not exceed \$2,600; the corresponding limits for families of six and eleven persons were \$2,500-\$3,250 and \$3,000-\$3,900 respectively.<sup>71</sup> A survey of the residents of one of the largest public housing projects in San Juan (1,150 units, 6,200 persons in



1964) revealed that 30 percent of the families had an income of less than \$1,000 annually, 48 percent and 19 percent fell within the \$1,000-\$1,999 and \$2,000-\$2,999 income classes respectively, and only 3 percent had an income of over \$3,000.<sup>72</sup> It is upon this evidence that the benefits of public disbursements on housing are postulated to accrue to families in income groups below \$3,000; the distributive series employed takes into account families only; that is, the total number of families, which includes unattached individuals, is not thought to be relevant since single individuals do not often obtain access to public housing units.<sup>73</sup>

#### Allocation of Pension and Social Security Benefits

The public expenditures classified functionally under this category include both federal and Commonwealth transfer payments. The apparent inconsistency of including federal OASDI benefits in a study purporting to measure the redistributive effects of the Puerto Rican fiscal system in isolation is due to the inclusion as part of the tax burden of OASDI social insurance contributions, the rationale for which has been previously explained (page 81). Those transfers to be distributed among family income classes are listed below in Table 15.

TABLE 15

UNITED STATES AND PUERTO RICAN PUBLIC TRANSFER  
EXPENDITURES, 1963  
(millions of dollars)

<u>Type of Transfer</u>	<u>Total</u>	<u>Percentage Distribution</u>
Federal OASDI Benefits	72.2	66.1
Commonwealth, Total	37.1	33.9
Pensions	8.2	7.5
Unemployment Compensation	11.5	10.5
<u>State Insurance Fund</u>	<u>17.5</u>	<u>16.0</u>
Total	109.3	100.0

Note: Details may not sum to totals due to rounding.

Source: Table A-15.

Note should be taken that not all transfers to individuals from the two government levels are itemized. Federal transfers to veterans are excluded because such payments are not Puerto Rican variables and no account is made on the tax side for the "burden" of military service. Although outlays made to the federal government for unemployment insurance and "other" social insurance contributions (Civil Service Retirement Fund and premiums of the National Service Life Insurance) are considered as part of the tax burden their receipt benefits are not distributed due to the absence of appropriate distributive series;<sup>74</sup>

the resultant understatement of the benefits is minimal because of the slight magnitude of these two totals. By the same criterion Puerto Rican central and municipal government transfers for scholarships, disability or death benefits of government employees, tax refunds and judgments, and indemnities are excluded; again the benefit underestimate is minimal. Public assistance payments, although transfers in their own right, are considered separately under the functional heading "Public Welfare."

The four types of transfers enumerated in Table 15 are essentially dual-purposed in nature. They seek either to maintain income in the face of short-run fluctuations or to set a floor under income levels permanently reduced or terminated.<sup>75</sup> Positing the non-shiftability of these outlays, costs are assumed to be incurred on behalf of the beneficiaries of the transfers, and each total is distributed by the appropriate series.

By far the largest component of the transfers under analysis is the OASDI benefits, and within OASDI itself old age retirement benefits account for the greatest share, their primary function being to shore up suddenly depleted income flows. The redistributive effects of this system in 1963 are of no small consequence; Puerto Rican residents contributed \$62.7 million and received \$72.2 million, with

the lowest three income classes (up to \$3,000) receiving far greater absolute amounts than contributions made (see Tables A-12 and A-16, Line 1). Those income classes above \$3,000 paid in more than they received. Such an effect should come as little surprise when it is realized that the aged and retired are heavily concentrated in the lower income brackets.<sup>76</sup> Moreover, because of the structure of contributive rates and benefits the beneficiary who was a low earner when part of the labor force receives relatively more benefits than does the recipient who earned more.<sup>77</sup> Deran points out an interesting aspect of the OASDI system which applies to Puerto Rico, because island residents did not experience OASI coverage until 1951, some 16 years after the Social Security Act went into effect.<sup>78</sup> The later the date at which one is covered by the Act the greater the windfall gain, for belated entrance has little effect upon the payment-benefit ratio. "No one retiring in 1966 could have been covered--that is, could have paid OASI taxes--his full working life, unless . . . he did not enter the working force until the age of 38."<sup>79</sup> The result is an inter-generational transfer, an income redistribution from young to old, for the younger the contributor the higher the contributions relative to benefits. A further consequence, it follows, is an income redistribution from the mainland

to the island. The OASDI aggregate benefit payment of \$72.2 million is allocated by the series "Social Security Receipts-OASI only"; that is, the series does not include benefits received for old age assistance, aid to the blind, and aid to other handicapped.

Pension outlays to retired public employees made by the Commonwealth central and municipal governments comprise 8 percent of total transfer disbursements. Contributions made to the various retirement systems and pension funds on an approximately equal basis by employee and employer provide the revenue source and have been considered as a portion of the family tax burden; consistency therefore requires that these benefits be allocated among income groups. As in the case of OASDI benefits the redistributive effect is basically from those who are currently employed to those who are no longer part of the labor force. Unlike OASDI benefits, however, those individuals attached to families in the lowest income brackets did not receive in the aggregate much greater absolute amounts than contributions made; this, of course, carries little significance unless each individual is separately examined. The total of \$8.2 million is allocated by the series "Other Government Pensions and Retirement Payments," a distribution which is self-explanatory and excludes OASDI benefits, public assistance, and aid to

the handicapped. The series' only drawback is that it includes State Insurance Fund compensations (discussed below) which are not separable; this limitation affects only the pension distribution by income class and not the overall transfer distribution since both pensions and Fund compensations are allocated by the same series.

The system of unemployment compensation, which distributed \$11.5 million in benefits in 1963, is financed by contributions levied on employers alone. In addition to general unemployment payments these disbursements cover unemployed workers in specially affected economic areas: the unemployed due to mechanization of the tobacco industry, to the closing of sugar mills, and to bulk shipments of sugar. The specific intent of these benefits is to alleviate temporary economic hardship caused by the interruption of income flows. Since the transfer is made directly to the unemployed it is easily assumed that these costs are incurred on behalf of the immediate beneficiary. The total is allocated by the series "Unemployment Insurance Benefits," a clearly appropriate distribution. As might be expected the recipients of the compensation are lumped in the income brackets below \$3,000.

The State Insurance Fund (Fondo del Seguro del Estado) administers an insurance system covering workers who suffer

occupational accidents; its services and disbursements are financed through compulsory levies on all employers, both private and public. The Fund provides medical assistance, including hospitalization and physical rehabilitation, through dispensaries funded and administered by the agency itself or through clinics and hospitals under contractual agreement. If the disabled worker is unable to return to his former employment due to physical incapacity he is given job training compatible with his limitations. Total administrative and medical expenses amount to \$6.84 million in 1963. In addition to this spending on goods and services the other main Fund function is that of monetarily compensating the injured worker or his beneficiaries; transfer payments on this account reach \$10.7 million. Both sub-totals are allocated by the series "Other Government Pensions and Retirement Payments" since both the medical and money outlays are incurred on behalf of the beneficiaries. It might be argued that the administrative expenses (29 percent of medical and administrative expenses) are incurred on behalf of all workers covered by the system so that they should be allocated by a wage and salary distribution. This is not carried out, as it would make little material difference on the income class allocations.

The apparent disparity in the treatment of State

Insurance Fund "transfers" is intentional. Actually, in the case of most public expenditure on pension and social security programs by far the largest proportion of total spending is in the nature of transfer payments, the administrative costs being minimal. These latter costs are ignored in regard to OASDI benefits, pensions, and unemployment compensation, but cannot be neglected with respect to the Fund because of their large relative importance.<sup>80</sup> Thus, the inclusion of the costs of goods and services provision by the Fund causes the transfers total in several tables to differ from the transfers total when dealing in terms of aggregate expenditures.<sup>81</sup> Given the exclusion of the administrative costs of OASDI, pensions, and unemployment compensation public expenditure incidence is minimally understated.

#### Allocation of Interest Payments on the Public Debt

Public expenditures on public debt service are necessarily included in the analysis since taxes are in part levied to cover these payments. The distribution of interest payments among the recipient families meets a formidable initial obstacle because from all evidence it appears that the largest portion of both central government and municipal government securities are in non-resident hands. This is primarily a result of the twin and interrelated conditions



of the lack of sufficient financial resources within Puerto Rico itself and of the width and depth of the New York financial markets to which the Commonwealth has easy access.<sup>82</sup> Due to this situation it becomes necessary to make some empirically unsupportable assumptions with respect to that portion of Commonwealth securities in non-resident possession. Discussions with officials at the Puerto Rican Treasury Department and the Government Development Bank (the agency in charge of marketing the central and municipal government obligations) brought out the complete lack of information regarding resident and non-resident institutional and individual holdings of Commonwealth securities.<sup>83</sup> Given the dearth of data it is assumed that 90 percent of central government securities and 50 percent of municipal government securities are held by non-residents.<sup>84</sup> Accordingly, of a total in interest payments of \$9.1 million and \$2.48 million disbursed by the central and municipal governments respectively only \$2.1 million is assumed to accrue to residents.

As a corollary to the unavailability of a resident-non-resident breakdown of security holdings a distribution of public obligations in resident portfolios is also lacking; that is, in order to estimate interest income by income class a distribution of the public debt by type of holder

is the first required piece of data. Commercial banks, savings and loan associations, insurance companies, individuals, pension funds, and the government itself all can be postulated to possess shares of the debt; if such a distribution were known the amount of interest paid to each type could be allocated by the appropriate distributive series. Although research among the portfolios of private banks and other institutional holders of the debt might have uncovered an approximation to the needed data it is felt not to justify the effort given the almost insignificant total of interest payments in relation to total public expenditures net of the exported portion (0.4 percent). For this reason the aggregate is distributed according to the percentage distribution of individual interest income even though it is realized that individuals as such may hold a small proportion of outstanding securities.<sup>85</sup> Moreover, the interest income series encompasses interest receipts from all sources, and not merely from interest payments on the public debt. Considering all the limitations imposed out of necessity upon the allocation among income classes of interest outlays on publicly issued debt obligations little confidence can be had regarding the final distribution found in Table A-21. Nevertheless, given the minutely small magnitude of the allocated total the distorting effect

on the distribution of all public expenditures is negligible.

### Allocation of General Expenditures

In contrast to expenditures on the above-discussed functional categories general expenditures entail a group of disbursements which present conceptual difficulties if allocation to individuals (family income classes) is attempted.<sup>86</sup> These difficulties arise primarily because of the indivisibility of the services rendered; that is, they are available for consumption by all families in equal amounts--the exclusion principle simply does not apply. For example, it is not easy to conceive that outlays on the legislative, executive, and judicial branches of government are incurred on behalf of a given family income group as are housing expenditures. On the other hand there are some expenditures (for example, recreation<sup>87</sup>) which, although not theoretically indivisible, are put into this category either because of the absence of a valid distributive series or because sufficient analysis cannot be carried out.

These expenditures are included in the analysis even though the option exists to exclude them completely. Such exclusion would, of course, understate the net fiscal benefit so that it would be necessary to omit an equivalent amount of tax revenue; however, the process of omission

would be tantamount to making certain assumptions regarding expenditure distribution. But inclusion on the basis of any single assumption (any given distributive series) may raise legitimate doubts as to the validity of the hypothesized allocation. Such difficulties force resort to a considerably arbitrary allocation on the basis of three alternative assumptions.<sup>88</sup> It is not claimed that these alternatives are by any means exhaustive, nor is a preference necessarily expressed in favor of any specific one. All that is offered is a set of feasible propositions from which one may choose if so inclined, and the tabular presentation facilitates this.<sup>89</sup>

Assumption (1) allocates total general expenditures according to the percentage distribution of family broad income on the supposition that there is a direct relationship between family income and benefits received from expenditures incurred; that is, higher income families are posited to have a greater "stake" in the government than do lower income families.

Assumption (2) allocates the total according to the percentage distribution of the total number of families; that is, on a per family basis. This postulate thereby assumes that public expenditures benefit all families in an equal manner, or that the costs incurred in the provision of services are constant for all families.

Assumption (3) allocates the total according to the percentage distribution of investment income on the supposition that the general expenditures correspond to given income sources. This actually becomes a more specific version of Assumption (1)--that higher income families benefit more from expenditures on protection and general government, and that the need for protection in particular increases at a greater rate than does income.<sup>90</sup> On the whole this hypothesis seems to be less tenable than Assumption (1). Since the costs of the services rendered by the general expenditures are assumed to be incurred on behalf of capital allowance is made for the exported share, the latter being the proportion of non-resident investment to total investment.<sup>91</sup>

Public Expenditure Incidence: The Empirical Estimates

In calendar year 1963 it is estimated that Puerto Rican resident families received benefits from \$480.0 million of public expenditures after allowances are made for the exported portion.<sup>92</sup> The lowest family income class--"less than \$1,000"--experienced costs incurred on behalf of it amounting to 19 percent of the total, with the successively higher income classes receiving 23, 18, 10, 7, 9, and 15 percent of the total respectively.<sup>93</sup> Figure 4 presents a Lorenz curve of the cumulative relationship between the total number of families and the assumed value of the

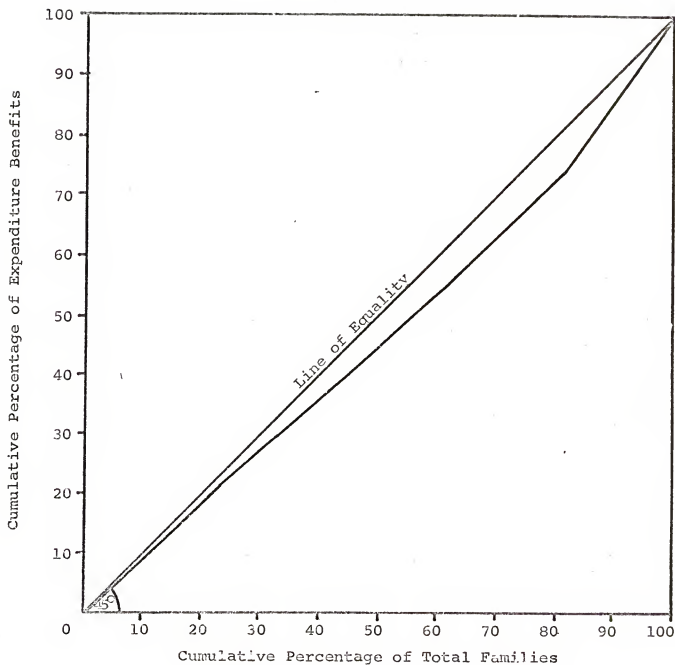


FIGURE 4  
TOTAL EXPENDITURE BENEFITS BY FAMILIES, CUMULATIVE, 1963

Sources: Tables 3 and A-21.

benefits received on account of public outlays. If the expenditure "burden" were equally distributed among all families 10 percent of the families would be the recipients of 10 percent of the benefits, 25 percent of the families would be the beneficiaries of 25 percent of the expenditures, etc. Such equality would be represented by the hypothetical 45 degree line of equality which appears in the chart; the actual estimated cumulative distribution is given by the curved line initiating at the origin 0 and rising to the diagonally opposite corner. As in the Lorenz curve of tax payments in Chapter III the total number of families is separated into quintiles. It may be observed that the lowest fifth of the families (lowest in terms of family income) receives approximately 19 percent of the spending benefits, the second fifth 17 percent, the third quintile 18 percent, the fourth 19 percent, and the highest fifth 27 percent.<sup>94</sup> Thus, the actual benefit distribution does quite closely approximate the line of equality, although this in itself bears little significance. One ought not to jump to the conclusion that the expenditure structure is progressive (pro-rich), for the Lorenz distribution indicates only a necessary but not sufficient condition for such a conclusion to be reached. It remains to express the costs incurred on behalf of each income class as a percentage of the income of

that class. Furthermore, the true meaning of the expenditure distribution is not really grasped until the tax payments distribution is combined with it to form the net fiscal distribution; this is the aim of the following chapter.

As in the previous chapter the effective expenditure rates are computed employing a money and imputed income base and a broad income base, with more emphasis being placed on the latter.<sup>95</sup> Table 16 and Figure 5 present the pattern of overall expenditure incidence for the three alternative general expenditure assumptions as well as for each functional spending category (see Figure 6 for a graphical exposition of the expenditure incidence of selected functional expenditures). The total expenditure structure (broad income base) is regressive over the entire income scale for all alternative assumptions--Lines 14, 16, and 18--inclusive of the exclusion of OASDI benefits--Lines 15, 17, and 19;<sup>96</sup> a slight exception occurs in the case of Assumption (3) when OASDI benefits are excluded as it is noted that the effective rate becomes proportional over the two highest income classes (Line 19). The regressive nature of the total expenditure structure remains basically unaffected by the use of a money and imputed income base--Table 17--with the exception of Assumption (3), where it is noticed that the



TABLE 16

EFFECTIVE PUBLIC EXPENDITURE INCIDENCE, ALL GOVERNMENT LEVELS, BY FUNCTIONAL  
CATEGORY AND FOR TOTAL EXPENDITURE STRUCTURE, 1963  
(broad income base)

Line	Functional Category	Percentages									
		Less than \$1,000	\$1,000-\$1,999	\$2,000-\$2,999	\$3,000-\$3,999	\$4,000-\$4,999	\$5,000-\$7,500				
1.	Education	41.7	10.9	7.0	4.7	3.6	2.7	0.8	5.3		
2.	Sanitation and Health	30.1	5.6	3.2	2.6	2.0	1.3	0.4	3.0		
3.	Public Welfare	10.0	2.3	1.3	0.2	0.1	0.1	0	0.8		
4.	Agriculture	3.3	2.2	1.2	0.9	0.6	0.5	0.2	0.8		
5.	Labor Relations	0.1	0.2	0.2	0.3	0.2	0.3	0.2	0.2		
6.	Transportation and Communication	0.7	0.7	0.9	1.5	1.5	1.9	1.9	1.5		
7.	Housing	2.9	1.4	0.9	0	0	0	0	0.4		
8.	Pensions and Social Security										
	(a) Commonweath	3.0	3.0	2.7	0.8	1.5	0.9	1.4	1.7		
	(b) OASDI Benefits	12.1	9.9	4.7	3.9	2.3	1.4	0.4	3.3		
9.	Interest Payments	0	0	0	0	0	0.1	0.2	0.1		
10.	Subtotal	103.8	36.1	22.1	14.7	11.9	9.2	5.5	17.1		

General Expenditures <sup>a</sup>									
11. Assumption (1)	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6
12. Assumption (2)	27.4	10.2	6.3	4.5	3.4	2.6	1.0	4.6	
13. Assumption (3)	0.3	0.5	0.9	1.4	1.7	2.3	5.1	2.6	
Total Expenditures									
14. Assumption (1)	108.4	40.8	26.7	19.4	16.6	13.8	10.1	21.7	
15. Excluding OASDI	96.4	30.9	22.0	15.5	14.3	12.5	9.7	18.5	
16. Assumption (2)	131.3	46.3	28.3	19.2	15.3	11.8	6.4	21.7	
17. Excluding OASDI	119.2	36.4	23.7	15.4	13.0	10.4	6.0	18.5	
18. Assumption (3)	104.1	36.6	23.0	16.1	13.6	11.5	10.6	19.7	
19. Excluding OASDI	92.0	26.7	18.3	12.2	11.3	10.1	10.1	16.4	

Note: Details may not sum to totals due to rounding.

<sup>a</sup>Assumption (1) assumes that general expenditures are distributed proportional to broad income; Assumption (2) assumes that general expenditures are distributed proportional to the total number of families; Assumption (3) assumes that general expenditures are distributed proportional to investment income.

Source:

Each line of Table A-21, which gives the distribution of all public expenditures, is expressed as a percentage of broad income, Table A-2, Line 8.

FIGURE 5

EFFECTIVE TOTAL EXPENDITURE INCIDENCE UNDER ALTERNATIVE  
GENERAL EXPENDITURE ASSUMPTIONS, 1963.  
(broad income base)

Note: Given that the effective rates within the highest family money income class are unknown each curve exhibits a dashed line after the mid-point of the "\$5,000-\$7,499" income class. The "trend" of the dashed portion of each line is upward if the effective rate is higher in this open-ended class than in the immediately preceding class, but is downward if the reverse is true.

Source: Table 16.

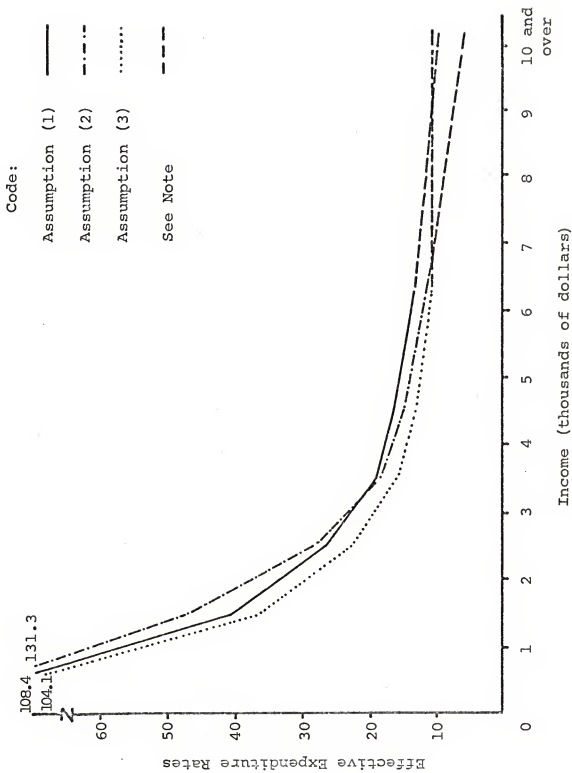


TABLE 17

EFFECTIVE PUBLIC EXPENDITURE INCIDENCE, ALL GOVERNMENT LEVELS, BY FUNCTIONAL CATEGORY AND FOR TOTAL EXPENDITURE STRUCTURE, 1963  
(money and imputed income base)

Line	Functional Category	Percentages									
		Less than \$1,000	\$1,000-\$1,999	\$2,000-\$2,999	\$3,000-\$3,999	\$4,000-\$4,999	\$5,000-\$5,999	\$6,000-\$6,999	\$7,000-\$7,999	\$8,000-\$8,999	\$9,000 and over
1.	Education	42.9	11.4	7.4	5.0	3.8	2.9	1.0	5.8		
2.	Sanitation and Health	30.9	5.9	3.4	2.7	2.1	1.4	0.4	3.3		
3.	Public Welfare	10.2	2.4	1.4	0.2	0.1	0.1	0	0.9		
4.	Agriculture	3.4	2.3	1.2	0.9	0.6	0.5	0.3	0.9		
5.	Labor Relations	0.1	0.2	0.2	0.3	0.2	0.3	0.2	0.2		
6.	Transportation and Communication	0.7	0.7	1.0	1.6	1.6	2.1	2.2	1.6		
7.	Housing	3.0	1.4	0.9	0	0	0	0	0.4		
8.	Pensions and Social Security										
	(a) Commonwealth	3.1	3.1	2.8	0.8	1.6	1.0	1.6	1.8		
	(b) OASDI Benefits	12.4	10.4	4.9	4.1	2.5	1.4	0.5	3.6		
9.	Interest Payments	0	0	0	0	0	0.1	0.2	0.1		
10.	Subtotal	106.6	37.8	23.3	15.7	12.7	9.7	6.5	18.7		

General Expenditures<sup>a</sup>

11. Assumption (1)	4.7	4.9	4.9	4.9	5.0	4.9	5.5	5.1
12. Assumption (2)	28.2	10.6	6.6	4.8	3.6	2.7	1.2	5.1
13. Assumption (3)	0.3	0.6	0.9	1.5	1.8	2.4	6.0	2.8
Total Expenditures								
14. Assumption (1)	111.3	42.6	28.2	20.6	17.7	14.6	12.0	23.8
15. Excluding OASDI	98.9	32.3	23.2	16.5	15.2	13.2	11.5	20.2
16. Assumption (2)	134.8	48.4	29.9	20.5	16.3	12.4	7.6	23.8
17. Excluding OASDI	122.4	38.0	25.0	16.4	13.8	11.0	7.1	20.2
18. Assumption (3)	106.9	38.3	24.2	17.2	14.5	12.1	12.5	21.6
19. Excluding OASDI	94.5	28.0	19.3	13.0	12.0	10.7	12.0	18.0

Note: Details may not sum to totals due to rounding.

<sup>a</sup>Assumption (1) assumes that general expenditures are distributed proportional to broad income; Assumption (2) assumes that general expenditures are distributed proportional to the total number of families; Assumption (3) assumes that general expenditures are distributed proportional to investment income.

Source:

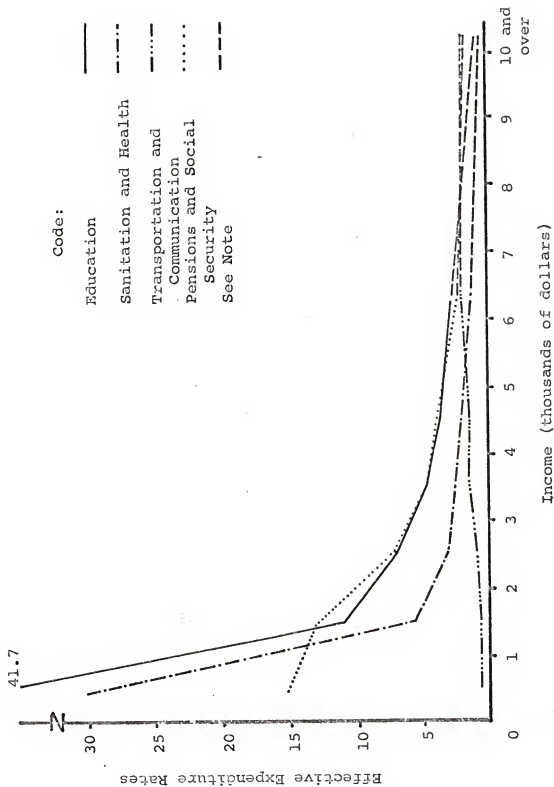
Each line of Table A-21, which gives the distribution of all public expenditures, is expressed as a percentage of money and imputed income, Table A-2, Line 1.

FIGURE 6

EFFECTIVE EXPENDITURE INCIDENCE OF SELECTED  
FUNCTIONAL OUTLAYS, ALL GOVERNMENT LEVELS, 1963  
(broad income base)

Note: Given that the effective rates within the highest family money income class are unknown each curve exhibits a dashed line after the mid-point of the "\$3,000-\$7,499" income class. The "trend" of the dashed portion of each line is upward if the effective rate is higher in this open-ended class than in the immediately preceding class, but is downward if the reverse is true.

Source: Table 16.





effective rate turns progressive over the two highest income brackets (Lines 18 and 19); such a minor exception is of little consequence to the overall conclusion that the Puerto Rican all-government level expenditure structure is favorable to the lower income families; that is, the effective rate of public expenditures decreases as income increases over the entire range of income classes. It is best to reiterate the observation, however, that the open-ended nature of the highest family income class makes it impossible to conclude anything with regard to the effective rate within the "\$7,500 and over" class; it is generally assumed that the rate continues to decline into this bracket, but such a supposition is not empirically supported.<sup>97</sup>

Turning to the specific components of the total expenditure structure, a number of functional expenditure classifications stand out. Disbursements on public welfare, housing, and OASDI benefits are all heavily weighted toward the lower income classes; this is to be expected since the former two are expended with the express intention of aiding low-income families whereas the latter represents receipts directed principally toward retirees who generally have few other income sources. Outlays on education, agriculture, and sanitation and health perhaps may be said to "fittingly" benefit the lower income families in larger proportion than

the higher income families. Education expenditure demonstrates such a highly regressive pattern because the children of the upper income families tend to gravitate toward private schooling;<sup>98</sup> similar reasoning may be employed in explaining the sanitation and health pattern since the more well-to-do families rely less on public facilities and more on private ones. In this latter category municipal spending is of relative importance, and it may be seen in Table A-25 that municipal outlays on health are quite favorable to the lower income groups whereas sanitation disbursements, although favorable, display a proportional effective rate across the \$3,000 to \$7,500 range.<sup>99</sup>

Commonwealth-disbursed transfer payments exhibit rather erratic behavior, although they remain generally favorable to the low-income brackets; such a rate pattern is due to the hodge-podge inclusion in these transfers of pensions, unemployment compensation, and disability payments. Whereas unemployment benefits contribute mainly toward maintaining income levels in low-income families pensions and disability payments are randomly spread over all income classes. Both interest payments and expenditures on transportation and communication display a progressive rate structure, but due to their relative unimportance they do not significantly affect the regressivity of the overall expenditure pattern.

Finally, with regard to general expenditures, the distribution according to Assumption (1)--according to broad income--does not affect the distributive pattern since the effective rate is proportional across the income scale; this, of course, must be the case since the base is broad income and the general expenditure total is allocated by a percentage distribution of broad income. Distribution according to Assumption (2)--the distribution of the total number of families--results in a regressive rate pattern, thereby reinforcing the total expenditure pattern. Allocation according to Assumption (3)--the distribution of investment income--results in a progressive expenditure incidence pattern at both the central and municipal levels. Such an outcome is not surprising given the extremely uneven distribution of investment income in Puerto Rico (80 percent accruing to families in income brackets over \$5,000). The fact that the total expenditure structure is only lightly regressive over the highest income classes under Assumption (3) and progressive if the income base is money and imputed income is largely due to this componential item.

In summation, it is noted that the expenditure side of the Puerto Rican fiscal system is structured, intentionally or unintentionally, so that the costs incurred on behalf of resident families benefit the poorer families relatively

more than the higher income families; that is, the incidence of total public expenditures is regressive at both the central and municipal government levels. It may be well, nevertheless, to reiterate certain qualifications which go hand-in-hand with this type of analysis, limitations which have been previously discussed.<sup>100</sup> The exactitude with which the effective rates of incidence are stated should not delude one, for they are admittedly imperfect estimates. Attention should be directed not to the specific magnitude of a given rate in a given income class but to the relative position of one income class vis-à-vis another. Moreover, the margin of error surrounding the effective rates of expenditure incidence is most likely larger than that of the effective rates of taxation given the greater range of empirically unsupportable assumptions that necessarily had to be posed. Although note was taken at several junctures of the possible existence of benefits enjoyed by society as a whole allowance was made for such external benefits only in the case of outlays on education and on general expenditures. Otherwise the methodological approach followed the hypothesis that costs are incurred on behalf of specific, denotable family income groups. Despite the deficient character of the computations sufficient confidence is retained in the analysis, so that the conclusion that the overall effective expenditure rate of incidence is regressive survives intact.

## NOTES

1. Taxation exists, too, as a fiscal policy instrument. The concern of this study is not, however, with this aspect of the taxation-expenditure cycle.

2. There are basically two reasons for the neglect of the expenditure side. Firstly, as will become evident below, the empirical problems encountered in distributing both specific and general expenditures loom greater than on the tax side. Secondly, the unacceptability of a quid pro quo relationship between the amounts an individual pays in taxes and the benefits he receives in public services leads many to the conclusion that the measurement of these benefits is merely an exercise in futility. It seems, of course, rather obtuse to throw up one's hands solely because the exclusion principle is not applicable to many public goods and services, for the result is to deny de facto that people receive benefits, or increases in real income, from such provision. For a lengthier discussion of this question see J. M. Buchanan, pp. 8-23.

3. Adler and Schlesinger, pp. 360-361.

4. Musgrave-Reforma tributaria, p. 45.

5. Charles Stauffacher, "The Effect of Governmental Expenditures and Tax Withdrawals upon Income Distribution, 1930-1939," Public Policy, Vol. II (1941), p. 236.

6. This terminology is from Gillespie (U.S. and Canada); the term "cost of service" is theoretically equivalent to his "costs incurred on behalf of" concept.

7. Erik Lindhal, "Just Taxation-A Positive Solution," in Richard A. Musgrave and Alan T. Peacock (eds.), Classics in the Theory of Public Finance (London: Macmillan and Co., 1964), pp. 168-176. For an excellent discussion of the Lindhal model refer to Richard A. Musgrave, "The Voluntary Exchange Theory of Public Economy," Quarterly Journal of

Economics, Vol. LIII (February, 1938), pp. 213-237; for the Bowen model refer to Howard R. Bowen, Toward Social Economy (New York: Rinehart and Company, 1948), pp. 176-178.

8. Paul A. Samuelson, "The Pure Theory of Public Expenditure," Review of Economics and Statistics, Vol. XXXVI (November, 1954), pp. 387-389; and "Diagrammatic Exposition of a Theory of Public Expenditures," Review of Economics and Statistics, Vol. XXXVII (November, 1955), pp. 350-356.

9. Among the more notable contributions in this area are Kenneth Arrow, Social Choice and Individual Values (New York: J. Wiley and Sons, 1951); J. M. Buchanan, Public Finance in Democratic Process (Chapel Hill: University of North Carolina Press, 1967); J. S. Coleman, "The Possibility of a Social Welfare Function," American Economic Review, Vol. LVI (December, 1966), pp. 1105-1122; and W. C. Birdsall, "A Study of the Demand for Public Goods," in R. A. Musgrave (ed.), Essays in Fiscal Federalism, pp. 235-294. An approach which perhaps offers new hope to the continuing problem of revealed preferences may lie in the application of cost-benefit analysis to expenditure policy. See, for example, Burton A. Weisbrod, "Income Redistribution Effects and Benefit-Cost Analysis," in Samuel Chase (ed.), Problems in Public Expenditure Analysis (Washington: The Brookings Institution, 1968); Richard A. Musgrave, "Cost-Benefit Analysis and the Theory of Public Finance," Journal of Economic Literature, Vol. VII (September, 1969), pp. 797-806.

10. The data on municipal government expenditures are derived from a distinct source. See Table A-20. For complete definitions of all functional components see Oficina del Gobernador, Negociado del Presupuesto, Presupuesto para el año fiscal de 1965 que propone el Gobernador a la Asamblea Legislativa del Estado Libre Asociado de Puerto Rico (San Juan: División de Imprenta del Departamento de Hacienda, 1964), pp. xvi-xxi.

11. Certainly the knowledge that it is eligible to receive a specific grant or that receipt depends upon matching funds influences expenditure patterns. Nevertheless, ultimate disposition lies with the U.S. executive/legislative branches.

12. Examples of other sources consulted are the annual reports of government agencies and Budget Bureau work sheets.

13. Data are available on the operational disbursements of U.S. defense agencies in Puerto Rico. See Junta de Planificación, Negociado de Análisis Económico y Social, Informe Económico al Gobernador, 1969 (San Juan: 1970), p. A-13. A table which estimates the value of common defense and internal security expenditures performed by the federal government in Puerto Rico in fiscal year 1964 is to be found in Hearings before the United States-Puerto Rico Commission on the Status of Puerto Rico, Vol. III, p. 702.

14. As an example take the contribution education has made to economic growth. See Edward F. Denison, The Sources of Economic Growth in the United States (New York: Committee for Economic Development, 1962), pp. 67-79 and p. 266; Theodore W. Schultz, "Capital Formation by Education," Journal of Political Economy, Vol. LXVIII (December, 1960), pp. 571-583. For an analysis of the external benefits of education see Burton A. Weisbrod, External Benefits of Public Education: An Economic Analysis (Princeton: Princeton University, 1964).

15. For U.S. data on this point refer to Herman P. Miller, "Annual and Lifetime Income in Relation to Education," American Economic Review, Vol. L (December, 1960), pp. 962-986. For Puerto Rican data referring to the educational level attained by the family head and his level of current income see Department of Labor of Puerto Rico, Report 1-A, pp. 38-47.

16. Gary S. Becker, "Underinvestment in College Education?", American Economic Review, Vol. L (Papers and Proceedings, May, 1960), pp. 346-354. Becker, in a later work, estimates that private rates of return on college education exceed those on business capital, but evidence is inconclusive regarding social rates of return; see Gary S. Becker, Human Capital (New York: Columbia University Press, 1964), especially Chapter 5.

17. This list of difficulties is discussed in greater depth in A. R. Prest and R. Turvey, "Cost-Benefit Analysis: A Survey," The Economic Journal, Vol. LXXV (December, 1965), pp. 683-735.

18. Thomas Johnson, "Returns from Investment in Human Capital," American Economic Review, Vol. LX (September, 1970), pp. 546-560.

19. Gillespie was able to follow this "ideal" approach in his U S. study. For a description of the procedure see Gillespie (U.S.), pp. 146-147.

20. División de Investigaciones Pedagógicas, Consejo Superior de Enseñanza, Estudio del sistema educativo de Puerto Rico (Barcelona: Ediciones Rumbo, 1961), pp. 539-548; the last year for which this source contains data is fiscal year 1959. Data for computing per pupil cost by level for fiscal years 1963 and 1964 are to be found in Departamento de Instrucción Pública de Puerto Rico, División de Estadísticas, Informe Anual Estadístico del Secretario de Instrucción Pública (Hato Rey), years 1962-63 and 1963-64.

21. The dropout problem is particularly acute in Puerto Rico. Data conclude that a mere 23 percent of those pupils commencing studies at the first grade level in public schools in 1951-52 completed the full 12 years in the allotted time span; see Departamento de Instrucción Pública, Informe Anual, 1962-63, Table 29. The "average" dropout comes from a large, low-income rural family in which the parental unemployment rates are higher than in Puerto Rico as a whole (Source: Records of the principal of a high school and a social worker in the municipality of San Germán). For a compilation of the many variables leading to decisions to leave school see División de Investigaciones Pedagógicas, pp. 921-928.

22. Oficina de Investigaciones Pedagógicas, Consejo Superior de Enseñanza, Estudio Socioeconómico II, Escala para medir el nivel socioeconómico y análisis de las condiciones sociales y económicas de los estudiantes de las escuelas públicas y privadas de Puerto Rico (Río Piedras: Universidad de Puerto Rico, 1966), p. 60.

23. Oficina de Investigaciones Pedagógicas, Consejo Superior de Enseñanza, Estudio Socioeconómico I, Escala para medir el nivel socioeconómico y análisis de las condiciones sociales y económicas de los estudiantes de primer año de las instituciones universitarias de Puerto Rico (Río Piedras: Universidad de Puerto Rico, 1966), p. 93.

24. It is not felt that extrapolation is required to update the pre-university series since a one-year difference probably causes insignificant shifts in the percentage distribution.



25. This is so even though the family distribution consists of only "full-year families"--those families which constitute a consumer unit over the entire year. A student member of a "full-year family" might have, for example, left the island after his May or August graduation date. Data on the total number of emigrants by age level and other socio-economic characteristics are readily available; see Junta de Planificación, *Negociado de Análisis Económico y Social, Informe Económico al Gobernador, 1966* (San Juan: 1967), pp. 221-227. Figures on student transfers from Puerto Rican public schools to the United States are available in the *Informes Especiales* of the Department of Education. Some information on university student emigration may be culled from U.S. census reports: United States Department of Commerce, Bureau of the Census, Census of the Population: 1960, Puerto Rico, General Characteristics, PC(1)53B and Census of Population: 1960, Puerto Ricans in the United States, Special Final Report, PC(2)1D (Washington: U.S. Government Printing Office, 1961 and 1963 respectively). The literature on Puerto Ricans living in the United States and/or Puerto Rican migration to the mainland is voluminous. See Belton M. Fleisher, "Some Economic Aspects of Puerto Rican Migration to the United States," Review of Economics and Statistics, Vol. XLV (August, 1963), pp. 245-253, and Department of Labor of Puerto Rico, Migration Division, Bibliography on Puerto Ricans in the United States (New York: 1959).

26. For a theoretical analysis of the "brain drain" see Weisbrod; for an empirical analysis of one small aspect see Herbert G. Grubel and Anthony D. Scott, "The Characteristics of Foreigners in the U.S. Economics Profession," American Economic Review, Vol. LVII (March, 1967), pp. 131-145.

27. Selma J. Mushkin, "Health as an Investment," Journal of Political Economy, Vol. LXX (October, 1962), Supplement, pp. 129-157.

28. Miguel A. Ramírez Pérez, Economía de los servicios de salud pública en Puerto Rico (Santurce: Departamento de Salud, 1966), pp. 23-24.

29. This fact is brought clearly to light by a comparative table in the Ramírez Pérez study; Ibid., Table 1.2. His Appendix C contains a description of each health program administered by the Health Department.

30. These categories and their percentage distribution are not assumed but are arrived at after examination of the Health Department budget.

31. Gordon K. Lewis, Puerto Rico: Freedom and Power in the Caribbean (New York: MR Press, 1963), p. 250.

32. Department of Health of Puerto Rico and The School of Public Health and Administrative Medicine, Columbia University, Medical and Hospital Care in Puerto Rico (San Juan: 1962), especially Chapter II and Appendix A.

33. See Table A-1, Line 29 for this series.

34. Ramírez Pérez, pp. 14-15. The Department of Health of Puerto Rico classifies a family as indigent if family income falls below \$3,000 per annum; 66 percent of the families in this study fall in the "indigent" category by this definition.

35. The program additionally includes free breakfasts to children of ages 2 to 10 who do not attend school; the breakfast program is far overshadowed in financial importance by the lunch program.

36. This ratio is based upon data contained in the annual reports of the Puerto Rican Aqueduct and Sewer Authority. Sixty-four and one-tenth percent of the Authority's total revenue collections from water customers was derived from the residential sector, whereas 32.9 percent was derived from the business--commercial and industrial--sector; 65.1 percent of the Authority's revenue from sewer customers was derived from the residential sector, the corresponding percentage for the business sector being 34.9 percent (all percentages represent the mean of fiscal years 1963 and 1964). Since both the water and sewer service rate schedules show declining charges per cubic meter after a given monthly rate of consumption, and assuming that primarily industrial and/or commercial concerns consume sufficient water to locate themselves on the declining portion of the rate schedule, the above proportions are reduced to 50:50. In addition, the monthly minimum charges are higher for non-residential sites than for residential sites. See Puerto Rico Aqueduct and Sewer Authority, Annual Report: 1963 and 1964 (San Juan: 1963 and 1964), p. 12 in each report.

37. See Table A-1, Line 35.

38. The discussion in this paragraph is based upon Department of Health of Puerto Rico and Columbia University, pp. 248-251.

39. See Table A-19.

40. For the requirements which must be fulfilled by the solicitant to receive assistance in each of the five categories refer to Departamento de Salud, División de Salud, División de Bienestar Público, Manual de normas y procedimientos de asistencia pública. At least one copy of the manual is found in each administrative site where welfare cases are investigated. Treatment of indigents may not be uniform because each office may interpret the norms differently.

41. Minimum necessities are defined as including food, clothing, personal effects, light, water, and fuel, with food receiving top priority.

42. See Table A-1, Line 6.

43. As an alternative to the allocation utilized here public welfare spending might be assumed "to benefit both recipients and others equally because they relieve the private welfare load that otherwise would be borne by higher income groups" (Brownlee, p. 32). From this would follow a per family distribution. No account is taken of this postulate due to the methodological approach adhered to in this study and to the doubt that the Puerto Rican higher income classes would assume such a burden.

44. For an excellent and brief description of each item covered under research and administrative expenses refer to Oficina del Gobernador, Negociado del Presupuesto, Presupuesto para el año fiscal de 1965, Sections 29-33 and 50.

45. Interviews with agricultural economists and other personnel at the Río Piedras experimental station, the Mayagüez experimental station, and the Mayagüez School of Agriculture led to this conclusion. This statement is equally true of the distribution of farm income, the derivation of which is explained below.

46. In 1963 total employment in agriculture amounted to 138,000 while that in forestry and fishing came to less than 2,000. See Junta de Planificación, Anuario Estadístico, Puerto Rico, 1967, p. 72. The total of 138,000 agricultural

workers might be reconciled with the total of 77,000 farm families by making the facile supposition that an average of one child per family is employed in the industry in addition to the family head.

47. Department of Labor of Puerto Rico, Report 1-C, p. 61.

48. The unemployment rate in Puerto Rico was in the 10-11 percent range in 1963, with the rural areas subject to higher rates and drastic seasonal unemployment. See Junta de Planificación, Negociado de Análisis Económico y Social, Informe Económico al Gobernador, 1965 (San Juan: 1966), pp. 50-52 and 175-188. The underemployed comprised 15.7 percent of total employment in 1963; one-third of farmers and farm workers were classified as underemployed in the same year. Moreover, agriculture stands revealed as the industry with the lowest percentage of steady workers; only about one-third of male wage and salary workers had steady employment--40 or more weeks a year and 30 or more hours per week. See Puerto Rico Planning Board, Bureau of Social and Economic Analysis, Manpower Report to the Governor: A Report on Society in Transition, pp. 118-119. Also see Department of Labor, Bureau of Labor Statistics, Full Employment and Underemployment in Puerto Rico, October, 1952-October, 1967, Special Labor Force Report No. 52.

49. This is the implication with respect to marketing gathered from an outdated but still relevant source. See John Kenneth Galbraith and Richard H. Holton, Marketing Efficiency in Puerto Rico (Cambridge: Harvard University Press, 1955).

50. The Department of Labor is also in charge of administering the insular unemployment insurance program; in addition it collects the disability premiums paid into the State Insurance Fund and determines the disability compensation due each injured worker. These functions are covered under pensions and social security below.

51. Its functions are patterned after the U.S. National Labor Relations Board; that is, it protects the worker's right to organize and bargain collectively, supervises union electoral procedures, and investigates and mediates negotiation and/or contract disputes. For a thorough analysis of the Board's functions, policies, and practices see Fred Barela, The Puerto Rico Labor Relations Act: A State Labor Policy and its Application (San Juan: Editorial Universitaria, 1965).

52. This is substantiated by several works. See Lloyd G. Reynolds and Peter Gregory, Wages, Productivity, and Industrialization in Puerto Rico (Homewood, Illinois: Richard D. Irwin, Inc., 1965), pp. 245-249; Stanley L. Friedlander, Labor Migration and Economic Growth: A Case Study of Puerto Rico (Cambridge, Massachusetts: The M.I.T. Press, 1965), pp. 101-104; José Hernández Alvarez, Return Migration to Puerto Rico (Berkeley: University of California, 1967).

53. Gillespie (Canada), pp. 97-105; Gillespie (U.S.), pp. 140-145.

54. D. Philip Locklin, Economics of Transportation (Homewood, Illinois: Richard D. Irwin, Inc., 1966), p. 624.

55. For further discussion of these functions see Charles L. Dearing, American Highway Policy (Washington: The Brookings Institution, 1942), pp. 158-163 and 209-212.

56. For a complete discussion of the different approaches consult U.S. Department of Commerce, Bureau of Public Roads, Final Report of the Highway Cost Allocation Study (Washington: U.S. Government Printing Office, 1961), especially Part III; for a résumé of many different approaches and references see Robley Winfrey, Economic Analysis for Highways (Scranton: International Textbook Co., 1969), pp. 602-637; for a detailed discussion and application of the relative-use approach see William D. Ross, Financing Highway Improvements in Louisiana (Baton Rouge: Louisiana State University Press, 1955), and Federal Coordinator of Transportation, Public Aids to Transportation, Vol. IV (Washington: U.S. Government Printing Office, 1940); additionally refer to William L. Hall, Financing Modern Highways for Montana (Helena: 1956); for the results of older studies see Charles A. Taff, Commercial Motor Transportation (Chicago: Richard D. Irwin, Inc., 1950), p. 46.

57. Brownlee, pp. 34-35.

58. U.S. Department of Commerce, Final Report of the Highway Cost Allocation Study; also see Winfrey, pp. 620-633.

59. U.S. Department of Commerce, Supplementary Report of the Highway Cost Allocation Study (Washington: U.S. Government Printing Office, 1965).

60. The following description of the incremental cost method is based upon John R. Meyer et al., The Economics of Competition in the Transportation Industries (Cambridge: Harvard University Press, 1959), pp. 69-85.

61. Gillespie (U.S.), pp. 184-185.

62. Brownlee, p. 35.

63. The data are found in A. Gómez Vallés, pp. 148-150. Although the figures relate to taxable gasoline and diesel oil consumption no difficulty is created since only slightly more than 3 percent of all oil and gasoline consumed is tax exempt. See Departamento de Hacienda de Puerto Rico, Informe Anual del Secretario de Hacienda, 1969, p. 38.

64. Such an allocation basis does impose serious limitations. If it is assumed that the "average" passenger car operates at a fuel consumption rate of 15 miles per gallon and the "average" truck at 10 miles per gallon transport efficiency is penalized since the truck can be assumed to weigh more than one and one-half times the car. On the other hand the ratio allocates the same responsibility per gallon consumed to a Volkswagen as to a 10-ton truck, thereby penalizing the lighter vehicle. To some degree these factors perhaps counterbalance one another.

65. See Table A-1, Line 30 for the derivation of this series.

66. Better known in Puerto Rico as CRUV-Corporación de Renovación Urbana y Vivienda.

67. The argument of this paragraph is based on Hugh O. Nourse, "Redistribution of Income from Public Housing," National Tax Journal, Vol. XIX (March, 1966), pp. 27-37. The synopsis below ignores many of Nourse's model-building assumptions but the essential character of the model is retained.

68. Jerome Rothenberg, "Urban Renewal Programs," in Robert Dorfman (ed.), Measuring Benefits of Government Investments (Washington: The Brookings Institution, 1965), pp. 292-341.

69. Prest and Turvey raise several points concerning this issue. The relevance of the increment of site values after slum clearance occurs is obvious, but their relevance

in the absence of a redevelopment program is not as clear; moreover, Rothenberg's expositive technique is an ex-post one, thereby introducing problems irrelevant to the ex-ante calculations required by the technique. See Prest and Turvey, pp. 719-720.

70. Rothenberg, p. 315.

71. The data source is a mimeographed table in the CRUV office in Mayagüez. Income is net of deductions allowable by the CRUV. The definition of who constitutes a family is roughly equivalent to the concept used throughout this analysis. For conditions governing eligibility refer to Puerto Rico Urban Renewal and Housing Corporation, Statement of Policies Governing Admission to and Continued Occupancy of the PHA-Aided Low-Rent Housing Projects Operated by this Corporation, mimeographed manuscript dated October 3, 1967, and July, 1967.

72. The data refer to calendar year 1964 but it is assumed that they are applicable to 1963; Research Office of the Urban Renewal and Housing Administration, A Report on Socio-Economic Conditions of the Nemesio R. Canales Public Housing Project (San Juan: 1966), p. 13 and Chart III.

73. Less than 3 percent of the units in the Canales project are occupied by individuals, and far less than 1 percent of the total number of persons in the project are unattached individuals.

74. This statement does not apply to the unemployment compensation benefits. Since 1961 Puerto Rico's unemployment insurance program has been incorporated into the federal-state system under the Federal Unemployment Tax Act. This Act levies a tax on employers at the rate of 3.1 percent on the first \$3,000 annually of an employee's pay in covered employments. Employers are permitted to credit up to 2.7 percent of taxable wages toward the 3.1 percent tax they must pay under an acceptable "state" law. The remaining 0.4 percent of the tax is collected by the federal government and earmarked for the payment of both federal and state (Puerto Rican) administrative expenses. Any excess is available for interest free loans to the states which experience depleted benefit reserves or for distribution among the states in proportion to their taxable payrolls if the loan fund is considered financially adequate. Actually, then, the benefits corresponding to the unemploy-

ment insurance contributions made by Puerto Rican employers are returned to Puerto Rico in various forms; that is, through goods and services expenditures on administrative services, through the receipt of interest free loans, or through the proportional distribution. The proportions in which Puerto Rico receives these benefits are not known, although the absolute value of the administrative expenses is given (\$1.6 million). Moreover, the lack of relevant distributive series to allocate the latter two types of returns leads, for the sake of convenience, to the exclusion of the entire amount.

75. United States Department of Health, Education, and Welfare, Social Security Administration, Social Security Programs in the United States (Washington: U.S. Government Printing Office, 1968), Part I.

76. Of those families whose head is 65 years of age or older 31.6 percent fall in the "less than \$1,000" income class, the percentage for all of Puerto Rico being 16.7; undoubtedly, if such a distribution were available for unattached individuals the percentage would be even higher, for 40 percent of total unattached individuals have reached the age of 65. Family data source: Department of Labor of Puerto Rico, Report 1-A, p. 18; unattached individual source: Ibid., Report 1-C, p. 58.

77. Ernest C. Harvey, "Social Security Taxes-Regressive or Progressive?", National Tax Journal, Vol. XVIII (December, 1965), pp. 408-414.

78. Elizabeth Deran, "Income Redistribution under the Social Security System," National Tax Journal, Vol. XIX (September, 1966), pp. 276-285.

79. Ibid., p. 283.

80. The administrative expenses of the cash benefit program of OASDI are approximately a mere 2 percent of contribution income; see U.S. Department of Health, Education, and Welfare, Social Security Administration, p. 41. Administrative expenses of the State Insurance Fund as a proportion of total expenditures (transfers and services) amount to 11 percent, and as a proportion of contributions 9.5 percent; administrative expenses of the varied pension funds, although not verified, can be expected to vary between 10 and 15 percent of the transfer total; the



administrative expenses of the Puerto Rican unemployment insurance program are covered by the federal government and amount to approximately 14 percent of compensation benefits paid out. The reason for their exclusion is discussed in note 74 above.

81. See, for example, Table A-15, Line 6, which includes only the pure transfer outlay and Table 19, which includes both the transfer payment and the cost of providing it.

82. "The Commonwealth government has carefully guarded and nurtured its credit rating in the New York capital market. It operates within a limit on debt-incurring capacity; it abides by the exact terms of sinking fund and other provisions of the bond contract; and its public authorities have operated with a comfortable margin of net income over debt service requirements. As a result, Commonwealth bonds enjoy a high credit rating, and the Commonwealth government has access to private external capital at a much lower cost than has any other underdeveloped country." James C. Ingram, Regional Payments Mechanisms: The Case of Puerto Rico (Chapel Hill: University of North Carolina Press, 1962), p. 137. Entrance to U.S. capital markets and the high degree of capital market integration between the mainland and Puerto Rico are facilitated by the use of a common money, since no problem of currency fluctuation arises. Ingram notes that the Puerto Rican public sector is a net receiver of funds from the rest of the world, the net receipts being primarily the result of sales of securities in U.S. markets; Ibid., p. 17.

83. The Government Development Bank, in addition to serving as the government's fiscal agent, functions as a source of credit for commercial and industrial development and as an intermediary between private industry and private credit institutions.

84. The interviewed officials concurred with these estimates in the sense that they considered the stated proportions as good an estimate as any which might be proffered.

85. For the distributive series see Table A-1, Line 11.

86. General expenditures comprise spending on the legislative, judicial, and executive branches, the pro-

tection of persons and property, industrial, commercial, and cooperative development, land conservation, recreation, miscellaneous public works, municipal assemblies and general administration, and non-classified services. See Tables A-18 and A-20 for a detailed listing of central and municipal government outlays.

87. For an analytical approach to measuring the benefits of public expenditures on recreation from a cost-benefit vantage point see Ruth P. Mack and Sumner Myers, "Outdoor Recreation," in Robert Dorfman (ed.), pp. 71-116.

88. Both central and municipal government general expenditures are allocated by the same three assumptions, so that the following discussion applies to either level of government.

89. Other studies of this nature have either excluded or included those items here classified as general expenditures. Adler and Schlesinger exclude the protection of persons and property and allocate this spending on the basis of real property holdings; Adler and Schlesinger, p. 386. Musgrave and Daicoff allocate it on alternative bases including the residential property tax; Musgrave and Daicoff; Gillespie allocates spending on land conservation by total consumption; Gillespie (U.S.).

90. This argument represents simply the other side of the coin to the benefit approach to taxation.

91. For this reason \$57.4 million is distributed under Assumption (3) as compared to \$102.5 million under Assumptions (1) and (2).

92. See Table 11. The \$480.0 million includes OASDI benefits.

93. These percentages represent a simple arithmetic average of the percentages accruing to each income class under the three different assumptions pertinent to the general expenditure allocation. A weighted average is not utilized since each hypothesis is given equal value.

94. Again the stated percentages are the mean percentages according to the three alternative assumptions for general expenditures.

95. Only the all-government level effective expenditure rates are expressed as percentages of the money and imputed income base. Central and municipal government levels are expressed as percentages of the broad income base alone. See Tables A-24 and A-25.

96. To reiterate a point made in Chapter I (note 2) a regressive expenditure schedule is one in which the effective expenditure rate declines as income rises. Thus, such a schedule is favorable to the lower income classes, or may be thought of as "pro-poor." On the other hand, a progressive expenditure schedule is one in which the effective expenditure rate increases as income rises; such a schedule is favorable to the higher income classes, and may be characterized as "pro-rich."

97. It is for this reason that the charts exhibit a dashed line after the mid-point of the "\$5,000-\$7,499" income class. In most cases this dashed line assumes a downward trend since its movement up until the "\$7,500 and over" class appears to be downward. For an exception see Figure 6 in which the dashed line representing the "trend" for the transportation and communication expenditure rate assumes an upward course.

98. This contention is statistically supported; almost 50 percent of the children attending private schools come from families with annual incomes of over \$7,500, while approximately 2 percent of the progeny of higher income families (over \$7,500 in annual income) attend public schools. See Oficina de Investigaciones Pedagógicas, Estudio Socioeconómico II, p. 60. These data do not include university level students.

99. Tables A-24 and A-25 of Appendix A contain the estimates of effective municipal government expenditure incidence and effective central government expenditure incidence as measured against a broad income base.

100. See pages 8-12.

## CHAPTER V

### THE NET FISCAL INCIDENCE PATTERN

Having analyzed and discussed the incidence of the total tax structure in Chapter III and that of the total expenditure structure in Chapter IV the two interdependent sides of the Puerto Rican budgetary system are now brought together to estimate the incidence of the overall fiscal system, thereby enabling one to measure the income redistributional effects of the fiscal structure in 1963. Faithful to the definition of incidence set forth in Chapter I net fiscal incidence is interpreted as the net change in an individual's economic position (as measured by current income) caused by the interaction of tax and public expenditure policies. Taxes represent a subtraction from family income whereas expenditures represent an addition to income. Thus, the net absolute fiscal distribution is defined as simply the distribution among family income classes of the costs incurred on behalf of each income group minus the distribution of tax payments taken from each group. From these net absolute amounts the net

fiscal incidence is obtained by expressing the former as a percentage of broad income, or whichever income base is deemed apposite.

Table 18 presents the effective rates of net fiscal incidence for the three alternative general expenditure assumptions in a manner in which federal OASDI benefits and social insurance contributions made to the federal government may be excluded if so desired. With a broad income base it is readily observed that the general pattern of net fiscal incidence is regressive; that is, as income increases the effective net fiscal rate decreases. The implication is clearly that the fiscal structure is favorable to the lower income classes which experience a net benefit. In contrast the higher income classes suffer a net burden, or negative net benefit (the table denotes the net burden as a negative rate). Centering attention on the combined effects of both levels of government it is noted that under general expenditure Assumptions (1) and (2)--the total general expenditures distributed according to broad income and the total number of families respectively--the four lowest family income classes--up to \$4,000--realize net benefits (Lines 1 and 4); on the other hand the "average" family in the three upper income groups experiences a net burden. Thus, income redistribution through the fiscal system occurs by reallocat-

TABLE 18

EFFECTIVE NET FISCAL INCIDENCE, ALL LEVELS OF GOVERNMENT, 1963  
(broad income base)

Line	Item	Percentages					
		Less than \$1,000	\$1,000-\$1,999	\$2,000-\$2,999	\$3,000-\$3,999	\$4,000-\$4,999	\$5,000-\$7,500 and over
Assumption (1) <sup>a</sup>							
1.	Total, All Levels	95.1	24.9	9.7	0.7	-0.4	-4.9 -8.4 4.0
2.	Total, Excluding OASDI Benefits and Federal Social Insurance Contributions	86.1	18.9	9.3	1.5	1.9	-2.9 -7.1 4.0
3.	Total, Excluding OASDI Benefits	83.2	15.0	5.0	-3.1	-2.7	-6.3 -8.9 0.7
Assumption (2) <sup>b</sup>							
4.	Total, All Levels	117.9	30.4	11.4	0.6	-1.6	-7.0 -12.1 4.0
5.	Total, Excluding OASDI Benefits and Federal Social Insurance Contributions	109.0	24.4	11.0	1.4	0.6	-4.9 -10.7 4.0
6.	Total, Excluding OASDI Benefits	106.1	20.5	6.7	-3.2	-4.0	-8.3 -12.5 0.7

Assumption (3) <sup>c</sup>									
7. Total, All Levels	90.8	20.8	6.0	-2.5	-3.3	-7.3	-8.0	2.0	
8. Total, Excluding OASDI Benefits and Federal Social Insurance Contributions	81.8	14.8	5.6	-1.8	-1.2	-5.2	-6.6	2.0	
9. Total, Excluding OASDI Benefits	78.9	10.9	1.3	-6.3	-5.7	-8.7	-8.4	-1.3	

<sup>a</sup>Assumption (1) distributes general expenditures proportional to broad income.  
<sup>b</sup>Assumption (2) distributes general expenditures proportional to the total number of families.  
<sup>c</sup>Assumption (3) distributes general expenditures proportional to investment income.

Source:

Each net fiscal amount of Table A-26 is expressed as a percentage of broad income, Table A-2, Line 8.

ing income from the higher to the lower income classes. The "break-even point," the income level at which net benefits turn to net burdens, cannot be specifically identified. Rather, it is better conceived of as an income range. Taking the empirical estimates at face value--that is, disregarding the various and perhaps serious limitations which may affect the actual magnitudes--the "break-even range" most likely occurs between \$3,500 and \$4,500.<sup>1</sup> Under general expenditure Assumption (3)--general outlays allocated according to investment income--the "break-even range" appears at a lower income level, probably somewhere between \$2,500 and \$3,500 (Line 7).

Exclusion of OASDI benefits or of both OASDI benefits and contributions made to federal social insurance programs has no effect on the general conclusions arrived at above. The fiscal structure remains favorable to the lower income classes, although the level and the distribution of the net fiscal incidence pattern are naturally affected. The exclusion of OASDI benefits alone of course leads to a reduction of the effective rate at each income level (compare Lines 1, 4, and 7 with Lines 3, 6, and 9 respectively); exclusion of OASDI benefits and federal insurance contributions generally causes an effective rate reduction in the lower income classes but an effective rate increase in the



higher income classes. This, too, is to be expected, for the three lowest income classes receive more in OASDI benefits than they pay out in contributions, while the opposite is true with respect to the four upper income brackets (compare Lines 1, 4, and 7 with Lines 2, 5, and 8 respectively).

Figure 7 permits a visual appreciation of net effective rates of incidence for the entire fiscal system (that is, including OASDI benefits and contributions to federal social insurance) under each alternative general expenditure assumption. Since negative effective rates of incidence are dealt with this figure out of necessity differs from those previously presented. The horizontal axis, prior to this juncture having coincided with the "zero redistribution line" (the line at which the effective incidence is equal to zero), now coincides with a negative rate of incidence set at a level which is appropriate to permit the given data to be graphed. Once again, the "break-even point" under Assumptions (1) and (2) falls in the income range \$3,500-\$4,500, while under Assumption (3), in which general expenditures are distributed more progressively, it falls in the \$2,500-\$3,500 range.

Table 19 presents the net fiscal effective incidence rates under the money and imputed income base. Other than the fact that the rates are slightly higher than under a

FIGURE 7

EFFECTIVE NET FISCAL INCIDENCE FOR ALTERNATIVE  
GENERAL EXPENDITURE ASSUMPTIONS, 1963  
(broad income base)

Note: Given that the effective rates within the highest family money income class are unknown each curve exhibits a dashed line after the mid-point of the "\$5,000-\$7,499" income class. The "trend" of the dashed portion of each line is upward if the effective rate is higher in this open-ended class than in the immediately preceding class, but is downward if the reverse is true.

Source: Table 18.

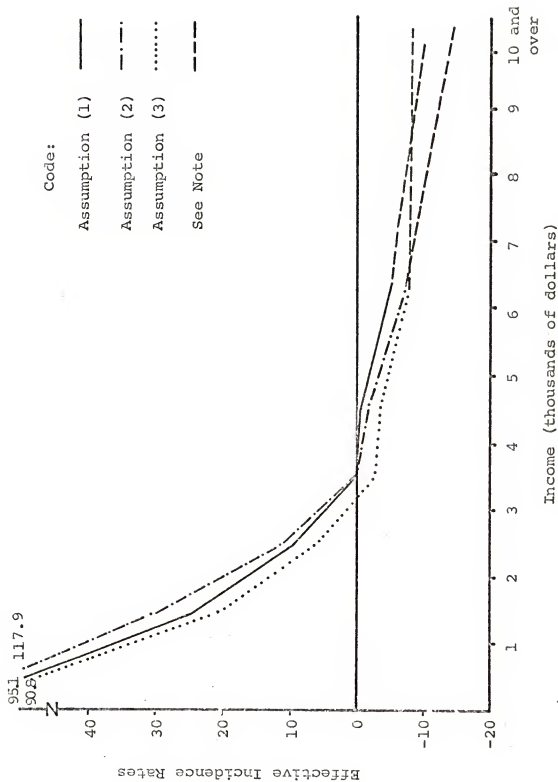


TABLE 19

EFFECTIVE NET FISCAL INCIDENCE, ALL LEVELS OF GOVERNMENT, 1963  
(money and imputed income base)

Line	Item	Percentages					
		Less than \$1,000	\$1,000-\$1,999	\$2,000-\$2,999	\$3,000-\$3,999	\$4,000-\$4,999	\$5,000-\$7,500 and over
	Assumption (1) <sup>a</sup>						
1.	Total, All Levels	97.6	26.1	10.2	0.8	-0.4	-5.2 -10.0 4.4
2.	Total, Excluding OASDI Benefits and Federal Social Insurance Contributions	88.4	19.7	9.9	1.6	2.0	-3.0 -8.4 4.4
3.	Total, Excluding OASDI Benefits	85.4	15.7	5.3	-3.3	-2.9	-6.6 -10.5 0.8
	Assumption (2) <sup>b</sup>						
4.	Total, All Levels	121.0	31.8	12.0	0.7	-1.7	-7.4 -14.3 4.4
5.	Total, Excluding OASDI Benefits and Federal Social Insurance Contributions	111.9	25.5	11.6	1.5	0.6	-5.2 -12.7 4.4
6.	Total, Excluding OASDI Benefits	108.9	21.5	7.0	-3.4	-4.2	-8.8 -14.8 0.8

Assumption (3) <sup>c</sup>								
7. Total, All Levels	93.3	21.7	6.3	-2.7	-3.5	-7.7	-9.5	2.2
8. Total, Excluding OASDI Benefits and Federal Social Insurance Contributions	84.0	15.4	5.9	-1.9	-1.2	-5.5	-7.9	2.2
9. Total, Excluding OASDI Benefits	81.0	11.4	1.4	-6.7	-6.0	-9.1	-10.0	-1.4

<sup>a</sup>Assumption (1) distributes general expenditures proportional to broad income.

<sup>b</sup>Assumption (2) distributes general expenditures proportional to the total number of families.

<sup>c</sup>Assumption (3) distributes general expenditures proportional to investment income.

Source:

Each net fiscal amount of Table A-26 is expressed as a percentage of money and imputed income, Table A-2, Line 1.

broad income base (because broad income is a more inclusive and therefore a greater absolute base) the conclusions reached with regard to the redistributive aspects of the fiscal system are identical.

At this point an alternative method of presenting the income redistributive effects of the Puerto Rican fiscal system is considered. Although the results are in no manner altered this second presentational option may serve to put the empirical estimates into clearer focus. As above, taxes are assumed to be subtractive from income and expenditures additive to income. Lorenz curves are utilized as visual indicators of the tabular statistical estimates. Although redistribution of income is estimated in terms of dollar magnitudes instead of percentages the same limitations pertinent to the effective incidence rate patterns apply here; thus, attention should not center upon the absolute dollar amounts but upon the amounts perceived by one family income class relative to the others.

With reference to Table 20 it is again apparent that the income groups up to \$4,000 experience a net gain in income after redistribution has taken place--under general expenditure Assumptions (1) and (2); under Assumption (3) the net gain is limited to income classes up to \$3,000. As income increases the amount of the net gain decreases until

TABLE 20

INCOME REDISTRIBUTION THROUGH THE OVERALL FISCAL STRUCTURE, 1963  
(millions of dollars)

Line	Item	Less than \$1,000	\$1,000-\$1,999	\$2,000-\$2,999	\$3,000-\$3,999	\$4,000-\$4,999	\$5,000-\$7,499	\$7,500 and over	Total
1.	Original Broad Income	76.2	257.6	326.6	238.5	215.5	359.3	737.3	2,209.2
2.	Tax Payments	10.1	40.8	55.5	44.3	36.6	67.4	136.6	391.3
3.	Expenditure Benefits:								
	(a) Assumption (1)	82.6	105.0	87.2	46.2	35.8	49.7	74.4	480.0
	(b) Assumption (2)	100.0	119.2	92.6	45.9	33.0	42.3	47.5	480.0
	(c) Assumption (3)	79.3	94.4	75.0	38.4	29.4	41.2	77.8	434.9
4.	Income after Redistribution:								
	(a) Assumption (1)	148.7	321.8	358.3	240.4	214.7	341.6	675.1	2,297.9
	Percent of Original Income	195.1	124.9	109.7	100.8	99.6	95.1	91.6	104.0

(b) Assumption (2)	166.1	336.0	363.7	240.1	211.9	334.2	648.2	2,297.9
Percent of								
Original Income	218.0	130.4	111.4	100.7	98.3	93.0	87.9	104.0
(c) Assumption (3)	145.4	311.2	346.1	232.6	208.3	333.1	678.5	2,252.8
Percent of								
Original Income	190.8	120.8	106.0	97.5	96.7	92.7	92.0	102.0

Note: Details may not sum to totals due to rounding.

Sources:

Line 1--Table A-2, Line 8.  
 Line 2--Table A-4, Line 11.  
 Lines 3(a), 3(b), and 3(c)--Table A-21, Lines 14, 16, and 18.  
 Line 4(a)--Line 1 minus Line 2 plus Line 3(a).  
 Line 4(b)--Line 1 minus Line 2 plus Line 3(b).  
 Line 4(c)--Line 1 minus Line 2 plus Line 3(c).



it turns to a net loss in the upper three income brackets [the upper four brackets under Assumption (3)]. Income after redistribution (Line 4) as a proportion of original broad income ranges from a high of 218 percent in the lowest income class to a low of 88 percent in the highest income class; of course, the "break-even" points occur within the same income ranges as previously. Referring to general expenditure Assumption (1) in dollar terms the net gain of the lowest income classes amounts to \$170.3 million whereas the net loss of the highest income classes totals \$80.7 million [Line 4(a) minus Line 1]. This comparison of net gains and losses raises a point which is to be discussed below, for it is clear that income redistribution within the Puerto Rican fiscal system is not solely the result of "transfers" from upper income bracket families to lower income bracket families. If this were the case net gains would equal net losses. The fact that net gains exceed net losses is due to the existence of a "budget deficit"; that is, the total expenditures distributed among income classes exceed the total tax payments so distributed. Why this is so is analyzed in Appendix B.

Table 21 implicitly assumes that the concept of an "average" family in each income class is viable. Utilizing such a concept it is noted that the average family in the

TABLE 21

"AVERAGE" FAMILY INCOME REDISTRIBUTION THROUGH THE OVERALL FISCAL STRUCTURE, 1963<sup>a</sup>  
(dollars)

Line	Item	Less than \$1,000	\$1,000- \$1,999	\$2,000- \$2,999	\$3,000- \$3,999	\$4,000- \$4,999	\$5,000- \$7,500 and over	Total
1.	Average Broad Income	747	2,012	3,266	4,500	5,986	7,984	20,481
2.	Average Tax Payment	99	319	555	836	1,017	1,498	3,794
3.	Average Expenditure Benefit: <sup>b</sup>							
	(a) Assumption (1)	810	820	872	872	994	1,104	2,067
	(b) Assumption (2)	980	931	926	866	917	940	1,319
	(c) Assumption (3)	777	738	750	725	817	916	2,161
4.	Average Income after Redistribution							
	(a) Assumption (1)	1,458	2,514	3,583	4,536	5,964	7,591	18,753
	(b) Assumption (2)	1,628	2,625	3,637	4,530	5,886	7,427	18,006
	(c) Assumption (3)	1,425	2,431	3,461	4,389	5,786	7,402	18,847

5. Net Income Change	757	511	294	-15	-107	-511	-1,946	148
6. Net Income Change as Proportion of Original Broad Income	101	25	9	0	-2	-6	-10	3

<sup>a</sup>By "average" family is meant that the total income, tax payment, or expenditure benefit accruing to each income class is divided by the number of families in that class. Each figure in the table is therefore an arithmetic mean corresponding to the conceptual or hypothetical "average" family.

<sup>b</sup>Assumption (1) distributes general expenditures by broad income; Assumption (2) distributes general expenditures by the number of families; Assumption (3) distributes general expenditures by investment income.

Sources:

Lines 1-4 are derived by dividing the totals in Table 20 by the total number of families in each income bracket.

Line 5--Mean of Lines 4 (a), 4 (b), and 4 (c) minus Line 1.

Line 6--Line 5 as a percentage of Line 1.

"less than \$1,000" income bracket realizes a gain of \$757 over and above its original income level due to public tax and expenditure policy [average broad income--Line 1--is subtracted from the arithmetic mean of average income after redistribution--Lines 4(a), (b), and (c)]; that is, given an initial broad income of \$747 the family pays \$99 in taxes and receives mean benefits valued at \$856, thereby increasing its income to \$1,504. For successively higher family income brackets the income gain is estimated at \$511, \$294, \$-15, -\$107, -\$511, and -\$1,946 (Line 5).

Finally, the consequences of income redistribution are pictured with the aid of Lorenz curves in Figure 8. The cumulative percentage of total families, commencing with those families in the lowest income class, is measured along the horizontal axis, and the cumulative percentage of income is measured along the vertical axis. Each curve depicted will therefore show, at any given point on it, the percentage of total income accruing to any given percentage of families; the 45-degree line of equality serves as a point of reference, for the closer each curve approximates it the more equal is the underlying income distribution. The solid outermost line depicts the distribution of broad income prior to the fiscal impact; the middle dashed curve illustrates the distribution of income after taxes are levied,

Original Income Distribution —————

After-Tax Income Distribution - - - - -

After-Tax and Expenditure Income Distribution ······

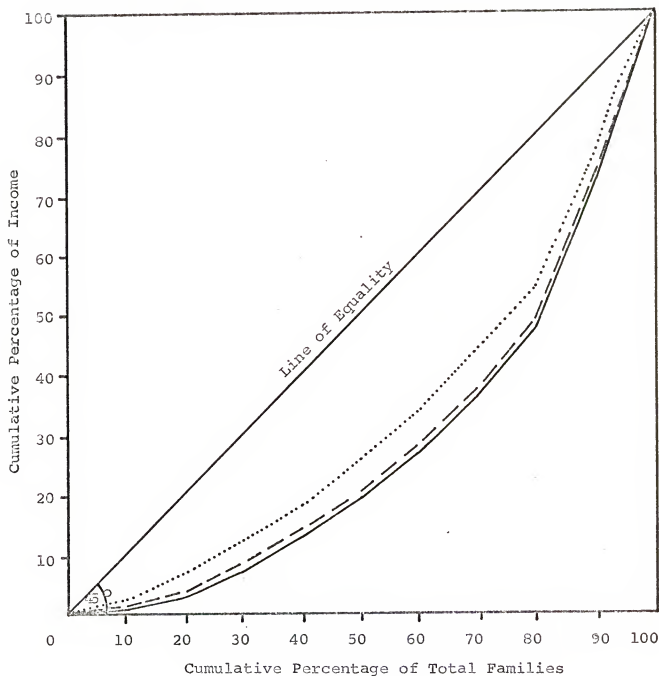


FIGURE 8  
INCOME REDISTRIBUTION THROUGH THE PUERTO RICAN  
FISCAL SYSTEM, 1963

Source: Table 22.

and the innermost dotted curve portrays income distribution after the effects of both taxes and expenditures are allowed for.<sup>2</sup> The movements of the curves in the direction of the line of equality indicate the income equalizing tendencies of the fiscal structure.

One interesting facet of this two-stage movement toward greater income equality is the role played by the tax and expenditure structures. Table 22 below indicates that the overall tax structure, although progressive, really has less effect on the equalization of income than does the expenditure structure, which provides the principal thrust toward income redistribution. For example, the lowest quintile of families receives 3.3 percent of total income before taxes and expenditures, 3.5 percent of the total after taxes alone, and 6.4 percent, 7.1 percent, or 6.4 percent [corresponding to general expenditure Assumptions (1), (2), and (3) respectively] after taxes and expenditures have produced their effects. The percentages corresponding to the first 40 percent of the families are 13.1 percent, 13.5 percent, and 17.8 percent, 19.0 percent, and 17.7 percent. Such an exercise is revealing, for although it is normally the legislative intent that the tax structure be progressive (or at least that certain taxes be so; for example, the personal income tax) this is not likely to be the case concern-

TABLE 22  
DISTRIBUTION OF INCOME BY CUMULATIVE PERCENTAGES OF FAMILIES, 1963  
(Lorenz Curves)

Quintiles	Cumulative Percent of Families	Cumulative Shares of Total Income				
		Initial Broad Income	Income After Taxes	Income After Taxes and Expenditures <sup>a</sup> Assumption (1)	Assumption (2)	Assumption (3)
Lowest	20	3.3	3.5	6.4	7.1	6.4
Second	40	13.1	13.5	17.8	19.0	17.7
Third	60	27.2	27.6	32.8	34.2	32.5
Fourth	80	48.2	48.6	53.4	54.6	53.0
Highest <sup>b</sup>	100	100.0	100.0	100.0	100.0	100.0

<sup>a</sup>Assumptions (1), (2), and (3) distribute general expenditures according to broad income, the total number of families, and investment income respectively.

<sup>b</sup>The income within this quintile is a residual calculation.

Sources:

Calculated from data in Tables 3 and 20.

ing the expenditure structure. Certainly specific expenditure programs are established with definite social welfare-human resource development goals in mind, but it may be posited that the regressive incidence of the overall expenditure pattern is fortuitous but incidental to these ends.

In conclusion, certain fairly obvious policy implications are suggested by the above analysis. If Commonwealth policy-makers opt for greater income redistribution, implementation of such a strategy would involve relatively more dependence upon the expenditure structure than upon the tax structure. The sole formidably progressive tax levy is the personal income tax; this suggests, for example, greater reliance upon the personal income tax and less upon the internal excises. Although the corporate profits tax may be highly progressive at high income levels lack of concrete evidence regarding its incidence should lead one to chart a prudent course in this instance. Taxes aside, it appears that public authorities would want to deal much more with specific functional expenditures to effectuate meaningful income redistribution. The highly regressive nature of public disbursements on education, health and sanitation, public welfare, and housing intimate the direction such a policy change might take. Dealing in absolute terms, since



spending upon education and health looms so relatively large in the island's total expenditure framework perhaps even more emphasis could be placed on these areas. On the other hand, since the effective expenditure rate pattern pertinent to expenditures on highways is estimated to be progressive, lesser priority might be extended to this area.

Of course, the objective of a more equitable income distribution through public finance may conflict, in the conventional wisdom, with the goal of economic growth; that is, the need for maximum saving to permit a high rate of capital formation must be reconciled with equity considerations. The Puerto Rican economy has registered one of the highest real growth rates in the world since the early 1950s. The question inevitably arises as to whether the principal public effort should be made toward increasing total output (which may be unevenly distributed) or toward raising the incomes of lower income families (which may deter the maximization of output). Assuming these aims are somewhat mutually exclusive a classic trade-off problem surfaces. The Puerto Rican Popular Democratic Party adopted the equity viewpoint in the early 1940s, only to find that the "pie" was too small to effectively accomplish either aim. There thus occurred a shift toward the increased output end, which culminated in the program of industrial

incentives and the establishment of the current political arrangement with the United States. Nevertheless, the desire for a more equitable income distribution remained just below the surface.

The Puerto Rican case is unique, however, in that its investment capital has flowed primarily from the United States and that aggregate domestic personal saving has been systematically negative. Thus, the need to restrict consumption to increase saving and subsequent growth-inducing investment has been minimal. In a sense Puerto Rico has been able to enjoy the best of both worlds. But, massive entrance of non-resident capital combined with aggregate personal saving insufficiency has created a possible balance of payments problem, for the net external debt reached a figure of \$1.28 billion in fiscal year 1964. One obvious measure that might be taken to resolve this situation is to increase the role of consumption-related taxation. Yet, the role of internal and external excise taxes is already large in the insular tax structure, and their basically regressive nature clashes with equity considerations.

Much more could be said about these problems. The literature on the relationship of public finance to economic growth is voluminous. The options selected, however, are outside the realm of positive economics, and inescapably

involve normative issues. Such considerations, although of utmost relevancy, are beyond the scope of this analysis.

## NOTES

1. For a résumé of these limitations see Chapter I, pages 8-12.

2. The innermost dotted line is derived by plotting points which reflect an average of income after taxes and expenditures under general expenditure Assumptions (1) and (2). If general expenditure Assumptions (1) and (3) were averaged the resulting curve would be located farther to the right; that is, income distribution would be more unequal. If general expenditure Assumption (2) were used alone the final curve would be located farther to the left, indicating a more equal income distribution than displayed here. Table 22 gives the cumulative shares of total income after redistribution under each general expenditure assumption.

APPENDIX A

TABLE A-1

## DISTRIBUTIVE SERIES, 1963

Line	Series	Less than \$1,000- \$2,000- \$3,000- \$4,000- \$5,000- \$7,500							
		\$1,000	\$1,999	\$2,999	\$3,999	\$4,999	\$7,499	and over	Total
1.	Wages and Salaries	2.0	10.3	15.6	12.3	11.3	19.9	28.7	100
2.	Net Unincorporated Business Income	2.7	8.6	14.4	10.8	8.0	13.0	42.5	100
3.	Receipts from Military Service	2.6	19.1	19.2	15.9	12.7	16.3	14.3	100
4.	Social Security Receipts (OASI only)	12.8	35.3	21.2	12.7	6.9	6.8	4.3	100
5.	Unemployment Insurance Benefits	15.5	39.6	24.2	2.9	13.3	4.4	-	100
6.	Public Assistance and Private Charity	41.1	31.1	22.3	2.5	1.1	1.9	-	100
7.	Cash Contributions from Persons Outside Family	15.8	31.0	19.1	6.2	10.8	13.3	3.9	100

TABLE A-1 continued

Line	Series	Less than										and over	
		\$1,000	\$1,999	\$2,000-	\$2,999	\$3,000-	\$3,999	\$4,000-	\$4,999	\$5,000-	\$7,499	Total	Total
8.	Other Government Pensions and Retirement Benefits	2.1	12.4	23.0	6.0	6.5	10.9	39.1	100				
9.	Rental Income	0.3	4.3	12.7	5.2	10.3	15.6	51.7	100				
10.	Dividend Income	-	1.0	1.5	2.2	1.5	4.0	89.8	100				
11.	Interest Income	1.0	3.6	5.6	4.9	4.2	9.7	71.3	100				
12.	Taxes Paid on Residential Property	0.4	1.9	4.4	6.6	6.7	15.9	64.1	100				
13.	Interest Paid on Personal Indebtedness	-	1.0	3.4	9.0	11.8	26.1	48.7	100				
14.	Investment Income	0.4	2.3	5.1	5.8	6.6	14.3	65.5	100				
15.	Total Consumption	4.1	13.8	17.2	12.4	10.4	17.9	24.1	100				
16.	Expenditures on Owned Dwelling	1.5	6.3	7.6	7.7	10.4	25.2	41.3	100				
17.	Rent Paid	3.2	11.0	17.2	14.3	11.6	20.5	22.2	100				

TABLE A-1 continued

Line	Series	Less than \$1,000	\$1,000-\$1,999	\$2,000-\$2,999	\$3,000-\$3,999	\$4,000-\$4,999	\$5,000-\$7,499	\$7,500 and over	Total
18.	Auto Operating Expenses	0.5	1.9	7.7	12.5	11.6	26.2	39.6	100
19.	Telephone and Telegraph Expenses	1.2	3.7	4.5	7.1	10.2	26.9	46.4	100
20.	Air and Other Public Transportation Expenses	4.6	18.1	21.1	12.6	9.2	13.6	20.8	100
21.	"Covered" Wages and Salaries	2.7	14.1	21.3	16.9	15.3	16.3	13.3	100
22.	Personal Income Tax	0.1	0.7	2.2	3.5	4.2	13.3	76.1	100
23.	Number of Families--Families Only	16.7	26.2	21.2	11.1	7.6	9.5	7.7	100
24.	Total Number of Families	20.4	25.6	20.0	10.6	7.2	9.0	7.2	100
25.	Value of Food Produced and Consumed by Families	16.2	35.5	24.3	8.8	8.8	4.3	2.1	100



TABLE A-1 continued

Line	Series	Less than \$1,000	\$1,000- \$1,999	\$2,000- \$2,999	\$3,000- \$3,999	\$4,000- \$4,999	\$5,000- \$7,499	\$7,500- and over	Total
26.	Family Money Income	4.0	12.2	15.7	11.6	10.5	17.2	28.7	100
27.	Broad Income	3.4	11.7	14.8	10.8	9.8	16.3	33.4	100
28.	Money and Imputed Income	3.7	12.2	15.4	11.1	10.1	16.9	30.8	100
29.	Reciprocal of Average Broad Income	50.0	19.0	12.0	8.0	6.0	5.0	-	100
30.	Expenditures on Transported Goods	4.6	15.4	18.6	12.7	10.5	17.1	21.1	100
31.	Students in Grades 1 to 12	34.4	23.8	18.2	8.8	5.9	6.7	2.2	100
32.	Students at University Level	13.4	20.4	21.5	10.7	9.1	13.1	11.8	100
33.	Farm Families	26.0	45.3	13.9	5.6	2.6	3.8	3.0	100
34.	Farm Income	7.7	23.2	23.1	13.6	8.9	12.0	11.6	100

TABLE A-1 continued

Line	Series	Less than \$1,000- \$2,000- \$3,000- \$4,000- \$5,000- \$7,500									
		\$1,000	\$1,999	\$2,999	\$3,999	\$4,999	\$7,499	and over	Total		
35.	Owned, Rented, and Free Dwellings	17.1	26.4	21.1	10.9	7.5	9.2	7.7	100		
36.	Factor Income	1.9	9.2	14.2	11.1	9.9	17.4	36.4	100		
37.	Miscellaneous Expenditures	2.7	9.3	14.1	8.9	9.0	16.8	39.3	100		

## Sources:

Lines 1 to 9--Department of Labor of Puerto Rico, Income and Expenditures of the Families, Puerto Rico, 1963, Report 2, Family Income by Source of Income (San Juan: June, 1967), pp. 1-2. Wage and salary income is net of occupational expenses, includes bonuses, commissions, tips, and military pay received for active service by personnel living at home, but excludes income in kind. Receipts from military service include mustering-out payments, cash bonuses to veterans, war insurance refunds, educational allotments, service-connected disability payments, and dependency allotments, but exclude regular pay for those family members on active duty. The series "Social Security Receipts (OASI only)" includes money received from old-age and survivors insurance under the federal Social Security Act, but excludes other social security benefits such as old-age assistance, aid to the blind, and aid to the handicapped; for this reason it is entitled "OASI only" even though it is employed to distribute OASDI totals (Old-Age, Survivors, and Disability Insurance). Public assistance and private charity income includes cash received from both private and public relief agencies, encompassing aid to the aged, blind, and other handicapped and excluding assistance

TABLE A-1 continued

in kind. Other government pensions and retirement payments include amounts received from public employees' pensions, State Insurance Fund compensations (disability), and chauffeurs' social security benefits. Rental income comprises net income received from the rental of real estate owned by the family if less than three properties are rented during the year; rental income from three or more properties is included in net unincorporated business income. All series relate to families only (exclusive of unattached individuals) due to the non-existence of similar series pertinent to unattached persons. The data refer to calendar year 1963.

Lines 10 to 13--The distributions are taken from work sheets of the Office of Economic and Financial Studies of the Puerto Rican Department of the Treasury, dated as of April 30, May 1, May 16, and May 21, 1968. The data relate to fiscal year 1964 alone, not representing averages of fiscal years 1963 and 1964 as is generally practiced throughout this study when data totals relate to fiscal years. Although similar distributions for fiscal year 1963 are available at the same source they are quite incomplete; therefore, rather than risk introduction of greater error figures for fiscal year 1964 alone are used. The raw data, which include both taxable and non-taxable returns, undergo certain adjustments (described in note 14 of Chapter II) before being subjected to the Newman procedure (see pages 37 - 43).

Line 14--Percentage distribution of Line 4, Table A-2. It includes dividend income and money and imputed rent and interest income.

Lines 15 to 20--Department of Labor of Puerto Rico, Income and Expenditures of the Families, Puerto Rico, 1963, Report 4-A, Expenditures of All Families (San Juan: November, 1967), pp. 38-47. For each income class the average family expenditure by item is given; this average is multiplied by the number of families (excluding unattached individuals) in each income group to derive absolute expenditure series from which the relative expenditure series of these lines are computed. Owned

TABLE A-1 continued

dwelling expenses include outlays on repairs and replacements. Consumption expenditures include financing charges and excise taxes whether or not payments are completed during the year 1963, but are net of trade-in allowances and refunds; consumer durables such as automobiles and furniture are considered as consumption items; purchases of homes are not. Those items used by the family in the home for business purposes are adjusted to exclude the portion chargeable to business use. Auto operating expenses include gasoline, oil, and service repair outlays. Line 21--This series is constructed by assuming that all wage and salary income in income classes less than \$5,000 is covered under OASDI regulations (in 1963 the maximum amount of earnings that was "taxed" under OASDI was \$4,800). The distribution of covered wages and salaries for the \$5,000-\$7,499 and "\$7,500 and over" income groups is estimated utilizing Treasury Department work sheets (see source of Lines 10-13) by multiplying by \$4,800 the number of taxable and non-taxable income tax returns in the adjusted gross income brackets over \$5,000. Since the Treasury brackets are classified from \$5,000-\$5,999 and \$6,000-\$7,999 it is assumed that 80 percent of the taxable returns and 90 percent of the non-taxable returns in the latter bracket fall within the \$5,000-\$7,499 income class (the Newman adjustments for the upper two brackets are not made since they would have minimal effect). For all income classes up to \$5,000 the Labor Department wage and salary distribution is employed (see source to Line 1 of this table). It is felt this procedure is more rational than to utilize the wage and salary distribution given in the Treasury work sheets since many lower income bracket individuals do not file returns, whereas probably a far greater proportion of individuals in the brackets over \$5,000 do so.

Line 22--This series is calculated from work sheets of the Office of Economic and Financial Studies of the Puerto Rican Department of the Treasury, dated April 15 and April 25, 1968. As is the case of the data in Lines 10-13 these figures

TABLE A-1 continued

relate to fiscal year 1964 alone, and undergo the same adjustments in addition to the Newman procedure. A personal tax distribution is calculable from the Labor survey, but it is not used because it includes federal income taxes and an unspecified amount of "other" taxes; see Department of Labor of Puerto Rico, Income and Expenditures of the Families, Puerto Rico, 1963, Report 4-A, Expenditures of All Families (San Juan: November, 1967), p. 35. The Labor data reveal an extremely similar distribution; in ascending order of income classes--0, 0.3, 0.9, 1.9, 3.6, 16.4, 76.9.

Line 23--Department of Labor of Puerto Rico, Income and Expenditures of the Families, Puerto Rico, 1963, Report 1-A, Income of All Families (San Juan: February, 1967), p. 6. This series relates to families exclusive of unattached individuals, and its absolute distribution is used to derive all those series whose source is the Labor survey data (since the Labor publications do not carry expenditure and income source distributions for unattached individuals). For the absolute distribution see Table A-13.

Line 24--This series is inclusive of both families and unattached individuals. The family distribution is that of Line 23 above, while the unattached individual distribution is derived from Department of Labor of Puerto Rico, Income and Expenditures of the Families, Puerto Rico, 1963, Report 1-C, Income of Non-Wage Earners' Families (San Juan: March, 1967), p. 57. The absolute unattached individual distribution is found in Table A-14 and the absolute total family distribution is contained in text Table 3.

Line 25--Department of Labor of Puerto Rico, Income and Expenditures of the Families, Puerto Rico, 1963, Report 2, Family Income by Source of Income (San Juan: June, 1967), p. 54. Note that the series covers families only.

Line 26--This series presents the distribution of combined family and individual monetary incomes as defined in the Labor survey. The purpose of its presentation

TABLE A-1 continued

here is to permit comparison with the broad and money and imputed income series of Lines 27 and 28. Its source is the same as that of Lines 23 and 24 above, and its absolute distribution is found in text Table 3, column (3).

Lines 27 and 28--See Lines 8 and 1 respectively of Table A-2.

Lines 29--This series is constructed specifically to distribute certain subtotals of health and sanitation expenditures (see Chapter IV, pages 126-133). For reasons relevant to public health expenditures families falling in income classes over \$7,500 are omitted from the series. Per family broad income is computed by the total number of families (see Table 3, column 1) pertaining to each income group. The reciprocal of each resulting average is then calculated, from which the relative series is derived.

Line 30--This series is essentially a variation of Table A-17 and is derived in the same fashion (see also the source of Lines 15-20 above). The proportion of consumer expenditures by major classifications which may be conceivably labeled transported goods is estimated on the basis of rational assumptions (but are not statistically supported). As an example, consumer outlays on such physical goods as furniture are conceptualized as expenditures on transported goods, whereas outlays on medical care are considered principally as expenditures on non-transported goods. The proportions of each broad consumer expenditure category estimated to consist of transported goods are as follows: Housing--40 percent; Household furniture and equipment--100 percent; Food--100 percent; Personal care--50 percent; Clothing--100 percent; Medical care--20 percent; Recreation, reading, and education--50 percent; Transportation--50 percent; Miscellaneous--50 percent. These ratios are then applied to the absolute distributions of consumer expenditures, the sums are taken and multiplied by the number of families (families only) in each income class, and the resulting percentage distribution of these totals represents the desired series.

Line 31--The raw data from which this series is adapted are contained in Oficina de

TABLE A-1 continued

Investigaciones Pedagógicas, Consejo Superior de Enseñanza, Estudio Socioeconómico II, Escala para medir el nivel socioeconómico y análisis de las condiciones sociales y económicas de los estudiantes de las escuelas públicas y privadas de Puerto Rico (Río Piedras: Universidad de Puerto Rico, 1966), p. 60. The original data, presented by family monthly income classes for both urban and rural public school students, are adjusted to make them more amenable for use in this study. Firstly, each family monthly income class is multiplied by 12 to put it on an annual income basis. Secondly, since the source gives a percentage distribution of student family income groups for urban and rural students separately a weighted average of the two percentage distributions is calculated; the weights are 2:1, urban to rural, and are based on enrollment figures in urban and rural schools. Thirdly, the weighted percentage distribution is adjusted by linear interpolation to conform to the family money income classes of this analysis. The results of these procedures are set forth below in Table A-1(a). A discussion of some of the limitations imposed by the just-described adjustments is found in the text, pages 123-124.

TABLE A-1(a)

## DISTRIBUTION OF PUBLIC SCHOOL STUDENTS, GRADES 1-12, 1963

Raw Data Family Income Classes	Weighted Percent	Study Family Income Classes	Percents by Linear Interpolation	Number of Students <sup>a</sup>
Less than \$1,200	41.3	Less than \$1,000	34.4	207,432
\$1,200-\$2,388	25.4	\$1,000-\$1,999	23.8	143,514
\$2,400-\$2,988	9.7	\$2,000-\$2,999	18.2	109,746

TABLE A-1 continued

TABLE A-1(a) completed

Raw Data Family Income Classes	Weighted Percent	Study Family Income Classes	Percents by Linear Interpolation	Number of Students <sup>a</sup>
\$3,000-\$3,588	6.0	\$3,000-\$3,999	8.8	53,064
\$3,600-\$4,188	4.2	\$4,000-\$4,999	5.9	35,577
\$4,200-\$4,788	3.9	\$5,000-\$7,499	6.7	40,401
\$4,800-\$5,988	3.7	\$7,500 and over	2.2	13,266
\$6,000-\$7,188	3.4			
\$7,200-\$8,988	1.4			
\$9,000 or more	1.0			
Total	100.0		100.0	603,000

<sup>a</sup>The total represents an average of student enrollment in school years 1962-63 and 1963-64. See Departamento de Instrucción Pública de Puerto Rico, División de Estadísticas, Informe Anual Estadístico del Secretario de Instrucción Pública, 1962-63 and 1963-64 (Hato Rey, Puerto Rico), p. 15 and p. 16 in each publication respectively. The total is distributed according to the final percentage distribution.

Line 32--The raw data from which this series is adapted are contained in Oficina de Investigaciones Pedagógicas, Consejo Superior de Enseñanza, Estudio Socioeconómico I, Escala para medir el nivel socioeconómico y análisis de las condiciones sociales y económicas de los estudiantes de primer año de las instituciones universitarias de Puerto Rico (Río Piedras: Universidad de Puerto Rico, 1966), p. 93. As is the



TABLE A-1 continued

case in Line 31 the original data are presented by family monthly income classes and necessitate certain adjustments. Firstly, each family monthly income class is multiplied by 12 to put it on an annual income basis. Secondly, since the source gives a percentage distribution of student family income groups for students at the two University of Puerto Rico campuses (Río Piedras and Mayagüez) in separate form a weighted average of the two distributions is calculated; the weights are 4:1, the Río Piedras campus to the Mayagüez campus, and are based upon enrollment figures. Thirdly, the weighted percentage distribution is adjusted by linear interpolation to conform to the family money income classes used in this study. The results are presented below in Table A-1(b). For further discussion of this process refer to the text, pages 124-125.

TABLE A-1(b)

## DISTRIBUTION OF UNIVERSITY STUDENTS AT PUBLIC INSTITUTIONS, 1963

Raw Data Family Income Classes	Weighted Percent	Study Family Income Classes	Percent by Linear Interpolation
Less than \$1,200	16.1	Less than \$1,000	13.4
\$1,200-\$2,388	26.5	\$1,000-\$1,999	20.4
\$2,400-\$2,988	12.7	\$2,000-\$2,999	21.5
\$3,000-\$3,588	6.6	\$3,000-\$3,999	10.7
\$3,600-\$4,188	6.2	\$4,000-\$4,999	9.1
\$4,200-\$4,788	5.7	\$5,000-\$7,499	13.1
\$4,800-\$5,988	7.9	\$7,500 and over	11.8

TABLE A-1 continued

TABLE A-1(b) completed

Raw Data Family Income Classes	Weighted Percent	Study Family Income Classes	Percents by Linear Interpolation
\$6,000-\$7,188	5.5		
\$7,200 or more	12.8		
Total	100.0		100.0

Line 33--Department of Labor of Puerto Rico, Income and Expenditures of the Families, Puerto Rico, 1963, Report 1-A, Income of All Families (San Juan: February, 1967), p. 78. For elaboration regarding this source see text Table 13 and text pages 138-139.

Line 34--See text Table 14 and text pages 141-143.

Line 35--This series is a weighted average of the three possible types of family tenure situations. The original percentage distributions by income classes are taken from Department of Labor of Puerto Rico, Income and Expenditures of the Families, Puerto Rico, 1963, Report 1-A, Income of All Families (San Juan: February, 1967), p. 48. The weights are 7:2:1, owned to rented to free dwellings, and are based upon the total number of families inhabiting each dwelling-tenure type.

Line 36--This series is a variation of Table A-2. It is the percentage distribution of the sum of Lines 2, 3, 4(a), 4(b), 4(c), and 7(a) exclusive of certain assumed adjustments relating to imputations and to non-resident factors. Lines 2, 4(c),

TABLE A-1 completed

and 7(a) remain unchanged. The total of Line 3 is reduced by 10 percent to \$278.6 million (and distributed as before) on the assumption that only 90 percent of net unincorporated business income accrues to residents; the imputed portions of net rental and interest income are excluded, leaving \$20.06 million and \$29.7 million to be distributed by the same series as previously.

Line 37--From Table A-17, Line 12.

TABLE A-2

INCOME CONCEPTS, TOTALS FROM NATIONAL ACCOUNTS, 1963  
(millions of dollars)

Line	Item	Less than \$1,000	\$1,000-\$1,999	\$2,000-\$2,999	\$3,000-\$3,999	\$4,000-\$4,999	\$5,000-\$7,500 and over	Total
1.	Money and Imputed Income, Total	74.2	246.3	309.6	223.9	202.7	340.0	2,016.6
2.	Wages and Salaries	24.9	128.1	194.0	153.0	140.5	247.5	1,243.5
3.	Net Unincorporated Business Income	8.4	26.6	44.6	33.4	24.8	40.2	309.6
4.	Investment Income, Total	0.7	3.8	8.6	9.8	11.0	24.0	167.7
	(a) Net Rental (including net imputed rent)	0.4	2.4	6.1	6.3	7.5	15.9	100.3
	(b) Interest (including net imputed interest)	0.3	1.2	2.2	3.0	3.3	7.3	46.7
	(c) Dividends	0	0.2	0.3	0.5	0.3	0.8	20.7

TABLE A-2 continued

Line	Item	Less than \$1,000	\$1,000-\$1,999	\$2,000-\$2,999	\$3,000-\$3,999	\$4,000-\$4,999	\$5,000-\$7,499	\$7,500 and over	Total
5.	Transfers, Total	32.2	70.0	50.2	23.3	22.0	26.0	22.2	245.8
	(a) Government	20.4	46.0	34.1	17.1	12.8	13.9	15.8	160.1
	(b) Business	0.6	2.1	2.6	1.9	1.6	2.7	3.6	14.9
	(c) Rest-of-World	11.2	22.0	13.5	4.4	7.7	9.4	2.8	70.8
6.	Food Produced and Consumed by Families	8.1	17.8	12.2	4.4	4.4	2.2	1.1	50.0
7.	Adjustments to Income, Total	2.0	11.3	17.0	14.6	12.8	19.3	115.7	192.6
	(a) Retained Earnings Accruing to Residents	0	1.0	1.5	2.2	1.5	4.1	90.9	101.2
	(b) Corporate Income Tax Imputation	0.1	0.5	0.7	0.7	0.6	1.1	8.7	12.3
	(c) Social Insurance Contribution-- Backward Shifted Portion	1.9	9.8	14.8	11.7	10.7	14.2	16.1	79.1

TABLE A-2 continued

Line	Item	Less than \$1,000	\$1,000-\$1,999	\$2,000-\$2,999	\$3,000-\$3,999	\$4,000-\$4,999	\$5,000-\$7,499	\$7,500 and over	Total
8.	Broad Income, Total	76.2	257.6	326.6	238.5	215.5	359.3	737.3	2,209.2
9.	Percentage Distribution	3.4	11.7	14.8	10.8	9.8	16.3	33.4	100.0

Note: Details may not sum to totals due to rounding.

Sources:

Line 1--Sum of Lines 2-6.

Line 2--The total is taken from Junta de Planificación, Negociado de Análisis Económico y Social, Ingreso y Producto, Puerto Rico, 1969 (San Juan: 1970), Tables 5 and 6, pp. 12-13. The total represents wages and salaries plus supplements less employee and employer contributions to federal and Commonwealth social insurance funds, and includes wages and salaries in kind; it is distributed according to wages and salaries, Table A-1, Line 1.

Line 3--The total is derived from the same source as is the total of Line 2 above; it also includes income in kind. It is distributed according to net unincorporated business income, Table A-1, Line 2.

Line 4--Sum of Lines 4(a), 4(b), and 4(c).

Line 4(a)--The total of \$100.3 million of net rental income is taken from work sheets of Junta de Planificación, Negociado de Análisis Económico y Social, División de Cuentas Sociales. The total includes the gross rental value of owner-occupied homes since the national accounts do not give a value for net imputed rent. Moreover, the

TABLE A-2 continued

national accounts do not give a breakdown between money and imputed rent. As a result a rather roundabout procedure is utilized to calculate the net rental value of owner-occupied homes. Total net rental income as given in the Labor Department survey--a strictly monetary income concept--amounts to \$16.59 million; see Department of Labor of Puerto Rico, Income and Expenditures of the Families, Puerto Rico, 1963, Report 2, Family Income by Source of Income (San Juan: June, 1967), p. 1. Positing a certain amount of under-reporting it is assumed that net money rental income comprises 20 percent of the \$100.3 million total. Thus, \$20.06 million of money rental income is distributed according to a rental income series (Table A-1, Line 9), while the remainder of \$80.24 million is assumed to be net imputed rent and is distributed according to taxes paid on residential property, Table A-1, Line 12.

Line 4(b)--The total of \$46.7 million of interest income is taken from the work sheets of Junta de Planificación, Negociado de Análisis Económico y Social, División de Cuentas Sociales. The total includes net imputed interest, which is calculated by taking net imputed interest accruing to private enterprises and households as a percentage of national income for the latest three published years (1956-1958) and applying the resultant percentage to 1963 national income; the published source is Junta de Planificación, Negociado de Planificación Económica y Social, Informe y Producto, Puerto Rico, 1940, 1947-1960 (San Juan), p. A-235. The resulting \$17 million of net imputed interest is distributed according to interest paid on personal indebtedness (Table A-1, Line 13) and the remaining \$29.7 million, assumed to be monetary interest income, is distributed by interest income, Table A-1, Line 11.

Line 4(c)--The total of \$20.7 million of dividend income accruing to residents is taken from the work sheets of Junta de Planificación, Negociado de Análisis Económico y Social, División de Cuentas Sociales. It is distributed according to dividends received by residents, Table A-1, Line 10.

Line 5--Sum of Lines 5(a), 5(b), and 5(c).

TABLE A-2 continued

Lines 5(a), 5(b), and 5(c)--Taken from Table A-15, Lines 7, 9, and 10 respectively. Line 6--The total of \$50.0 million utilized here represents a divergence from the totals distributed in the rest of the table, for it is taken not from the national accounts but from the Labor survey; see Department of Labor of Puerto Rico, Income and Expenditures of the Families, Puerto Rico, 1963, Report 2, Family Income by Source of Income (San Juan: June, 1967), pp. 52-53. The rationale behind the use of Labor data is that in this instance it is thought to be more accurate than the social accounts figure (for the reason for doubting the accuracy of the latter figure see the source to Table 1, Line 3). Therefore, the \$50 million represents food produced and consumed by all families, and not only food produced and consumed on the farm; this distinction is apparently not of great import, however, for urban families produce and consume very little food (this statement is statistically supported by the above cited Report 2, Ibid., p. 54). The total is distributed according to the value of food produced and consumed by families, Table A-1, Line 25.

Line 7--Sum of Lines 7(a), 7(b), and 7(c).

Line 7(a)--The total of \$101.2 million of retained earnings accruing to residents is taken from the work sheets of Junta de Planificación, Negociado de Análisis Económico y Social, División de Cuentas Sociales. It is distributed according to dividends received by residents (Table A-1, Line 10), a series assumed to reflect resident corporate ownership distribution.

Line 7(b)--The imputed value refers to the Standard Case used for measuring the distribution of the corporate income tax. Since both wage-earners and stockholders experience before-tax income reductions due to the corporate tax this reduction is returned to them by this item. The figures in each income class are the sums of Lines 1 and 3 of Table A-6.



TABLE A-2 completed

Line 7(c)--The figures appearing in each income class are taken from computations made during the procedures involved in distributing social insurance contributions by income group. The theoretical rationale for this addition to income is similar to that of Line 7(b) above.

Line 8--Sum of Lines 1 and 7.

Line 9--Percentage distribution of Line 8.

TABLE A-3

TOTAL TAX RECEIPTS BY TYPES OF TAX,  
FISCAL YEARS 1963 and 1964  
(millions of dollars)

Line	Tax	Fiscal 1963	Fiscal 1964	Average Calendar 1963
1.	Personal Income <sup>a</sup>	50.6	62.1	56.4
2.	Corporate Income <sup>a</sup>	34.9	41.0	38.0
3.	Internal Excises	115.7	127.0	121.4
4.	Customs Duties	11.9	12.6	12.3
5.	Property <sup>b</sup>	31.1	34.7	32.9
6.	Inheritance and Gift	2.1	3.3	2.7
7.	Licenses	11.8	12.8	12.3
8.	Municipal <sup>c</sup>	3.7	4.4	4.1
9.	Lottery <sup>d</sup>	<u>10.6</u>	<u>11.1</u>	<u>10.9</u>
10.	Total	272.4	309.0	291.0
11.	Social Insurance	120.4	138.0	129.3
	(a) Federal	67.2	77.4	72.3
	(b) Commonwealth	<u>53.2</u>	<u>60.6</u>	<u>56.9</u>
12.	Total, All Taxes	392.8	447.0	420.3

<sup>a</sup>One-half of the partnership income tax is allocated to both the personal and corporate income taxes since partnerships are taxed under the rates applicable to corporations and partners are taxed as individuals on those profits distributed to them.

<sup>b</sup>Includes the property taxes levied at both the central and municipal government levels but collected at the central level. Under Act Number 24 of June 8, 1962, there was established an exemption on the first \$15,000 of all owner-occupied residences. To compensate the municipalities for

TABLE A-3 completed

revenue lost under this Act the central government, from the Treasury's General Fund, appropriates to the municipalities the amount their treasuries lost due to the cited legislation. Additionally, Law Number 16 of May 31, 1960, authorizes the Treasury Department not to collect 20 hundredths of one percent of the basic property tax levied by the municipalities; this too is compensated for by an appropriation from the Treasury's General Fund. The sum of these two appropriations is eliminated from municipal property tax collections to avoid double-counting.

<sup>c</sup>Gross receipts--patentes--and slaughterhouse taxes comprise approximately 90 percent of the total.

<sup>d</sup>Includes the 25 percent transferred to the municipalities, but double-counting is eliminated; the figures are net of operating expenses, premium payments, and commissions.

#### Sources:

Lines 1 to 4 and 6 and 7--Departamento de Hacienda de Puerto Rico, Informe Anual del Secretario de Hacienda, 1969 (San Juan: 1969), pp. 15-16. Since this source does not break down the tax paid by partnerships recourse is had to the work sheets of the Planning Board in order to allocate 50 percent of the partnership tax to personal income taxes and 50 percent to corporate income taxes (Junta de Planificación, Negociado de Análisis Económico y Social, División de Cuentas Sociales).

Line 5--Work sheets of the Office of Economic and Financial Studies, Puerto Rican Department of the Treasury.

Line 8--Departamento de Hacienda de Puerto Rico, Administración de Asuntos Financieros, Negociado de Asuntos Municipales, Informe Anual del Negociado de Asuntos Municipales, fiscal years 1963 and 1964 (San Juan: 1963 and 1964), Table 16(d) in each publication.

Line 9--Departamento de Hacienda de Puerto Rico, Informe Anual del Secretario, 1963 and 1964 (San Juan: 1963 and 1965), p. 20 and p. 24.

Line 10--Sum of Lines 1-9.

Lines 11, 11(a), and 11(b)--Work sheets, Junta de Planificación, Negociado de Análisis Económico y Social, División de Cuentas Sociales.

Line 12--Sum of Lines 10 and 11.

TABLE A-4

ESTIMATED DISTRIBUTION OF TAX PAYMENTS, 1963  
(millions of dollars)

Line	Tax	Less than \$1,000	\$1,000-\$1,999	\$2,000-\$2,999	\$3,000-\$3,999	\$4,000-\$4,999	\$5,000-\$7,500	\$7,500 and over	Total
1.	Personal Income	0.06	0.39	1.24	1.97	2.37	7.50	42.92	56.4
2.	Corporate Income	0.57	2.13	2.78	2.14	1.80	3.24	11.62	24.3
3.	Internal Excises	3.73	15.39	19.53	15.57	10.52	22.05	28.79	115.6
4.	Customs Duties	0.50	1.68	2.10	1.51	1.27	2.18	2.94	12.3
5.	Property	0.61	2.16	2.86	2.26	2.02	3.83	9.66	23.4
6.	Inheritance and Gift	-	-	-	-	-	-	2.73	2.7
7.	License	0.17	0.71	1.27	1.47	1.27	2.92	4.49	12.3
8.	Municipal	0.17	0.57	0.71	0.51	0.43	0.73	0.99	4.1
9.	Lottery	0.29	1.01	1.54	0.97	0.98	1.83	4.28	10.9
10.	Social Insurance	<u>3.95</u>	<u>16.73</u>	<u>23.44</u>	<u>17.94</u>	<u>15.89</u>	<u>23.16</u>	<u>28.16</u>	<u>129.3</u>
11.	Total	10.05	40.77	55.47	44.34	36.55	67.44	136.58	391.3

TABLE A-4 continued

Line	Tax	Less than \$1,000- \$1,000	\$1,000- \$1,999	\$2,000- \$2,999	\$3,000- \$3,999	\$4,000- \$4,999	\$5,000- \$7,499	\$7,500 and over	Total
12.	Percentage Distribution	2.6	10.4	14.2	11.3	9.3	17.2	34.9	100.0
13.	Total, Excluding Social Insurance and Lottery	5.81	23.03	30.49	25.43	19.68	42.45	104.14	251.1
14.	Percentage Distribution	2.5	9.2	12.1	10.1	7.8	16.9	41.5	100.0
15.	Total, Excluding Federal Social Insurance	7.82	30.88	41.36	33.44	26.85	55.07	123.53	319.0
16.	Percentage Distribution	2.5	9.7	13.0	10.5	8.4	17.3	38.7	100.0

Note: Details may not sum to totals due to rounding.

Sources:

Line 1--The total from Table A-3 is allocated by Line 22, Table A-1.

Line 2--Table A-6, Line 4.

Lines 3, 4, 7, and 8--Table A-7, Lines 7, 9, 15, and 17 respectively.

Line 5--Table A-10, Line 9.

Line 6--Given the nature of the tax laws and the included exemptions it is assumed that the entire burden of this tax falls on the "\$7,500 and over" class; see pages 77-78 of the text for further explanation.

Line 9--This is theoretically a type of excise tax; the total figure of \$10.9 million (see Table A-3) represents net lottery revenue; that is, gross revenue from ticket sales less prizes, commissions, and operating expenses. The aggregate is distributed

TABLE A-4 completed

according to a miscellaneous expenditure series in which one of the component items is lottery ticket purchases--an admittedly poor series.

Line 10--Table A-12, Line 8.

Line 11--Sum of Lines 1-10.

Line 12--Percentage distribution of Line 11.

Line 13--Line 11 minus Lines 9 and 10.

Line 14--Percentage distribution of Line 13.

Line 15--Line 11 minus Lines 1-3 of Table A-12.

Line 16--Percentage distribution of Line 15.

TABLE A-5

AVERAGE (PER FAMILY UNIT)<sup>a</sup> TAX PAYMENT BY TYPES OF TAX, 1963  
(dollars)

Line	Tax	Less than \$1,000	\$1,000-\$1,999	\$2,000-\$2,999	\$3,000-\$3,999	\$4,000-\$4,999	\$5,000-\$7,499	\$7,500 and over	Total
1.	Personal Income	1	3	12	37	66	167	1,192	113
2.	Corporate Income	6	17	28	40	50	72	323	49
3.	Internal Excises	37	120	195	294	292	490	800	231
4.	Customs Duties	5	13	21	28	35	48	82	25
5.	Property	6	17	29	43	56	85	268	47
6.	Inheritance and Gift	-	-	-	-	-	-	76	5
7.	License	2	6	13	28	35	65	125	25
8.	Municipal	2	4	7	10	12	16	28	8
9.	Lottery	3	8	15	18	27	41	119	22
10.	Social Insurance	39	131	234	338	441	515	782	259
11.	Total <sup>b</sup>	99	319	555	837	1,015	1,499	3,794	783

TABLE A-5 continued

Line	Tax	Less than \$1,000- \$2,000- \$3,000- \$4,000- \$5,000- \$7,500					
		\$1,000	\$1,999	\$2,999	\$3,999	\$4,999	\$7,499 and over Total
12. Total, Excluding Social Insurance and Lottery	57	180	305	480	547	943	2,893 502
13. Total, Excluding Federal Social Insurance	77	241	414	631	746	1,224	3,431 638
14. Broad Income <sup>c</sup>	747	2,012	3,266	4,500	5,985	7,985	20,479 4,418

although the table purports to give per family tax payment by income class it actually includes both family and unattached individual payments. See the family distribution, Table 3, for further explanation.

<sup>b</sup>Details may not sum to totals due to rounding.

<sup>c</sup>It is to be noted that with the use of the broad income concept the average family in all income classes above "less than \$1,000" becomes "bracket jumpers"; that is, it is moved into a higher income class due to the inclusion of non-monetary income. It is not possible to ascertain how many families from each class jump to the next bracket nor to determine what proportion of income they take with them if they do fall in a higher class. However, as Gillespie observes, "such a determination is unnecessary because bracket jumpers take with them their tax burden as well as their income. If it is assumed that bracket jumpers carry with them an equal proportion of income and of taxes from the lowest bracket then the effective tax rate . . . will not change after allowance is made for bracket jumpers." See W. Irwin Gillespie, "Effect of Public Expenditures on the Distribution of Income," in R. A. Musgrave (ed.), Essays in Fiscal Federalism (Washington: The Brookings Institution, 1965), p. 176. Given this assumption the problem may be ignored.



TABLE A-5 completed

## Sources:

- Lines 1 to 13--Each line of Table A-4 is divided by the total number of families corresponding to each family money income class, Table 3.
- Line 14--Line 8 of Table A-2 is divided by the total number of families corresponding to each family money income class, Table 3.

TABLE A-6

DISTRIBUTION OF THE CORPORATE INCOME TAX, STANDARD AND ALTERNATE CASES, 1963  
(millions of dollars)

Line	Item	Less than \$1,000- \$2,000- \$3,000- \$4,000- \$5,000- \$7,500									
		\$1,000	\$1,999	\$2,999	\$3,999	\$4,999	\$7,499	and over	Total		
Standard Case											
1.	Stockholders	-	0.09	0.13	0.19	0.13	0.34	7.65	8.5		
2.	Consumers	0.49	1.65	2.06	1.48	1.24	2.14	2.88	12.0		
3.	Wage-Earners	<u>0.08</u>	<u>0.39</u>	<u>0.59</u>	<u>0.47</u>	<u>0.43</u>	<u>0.76</u>	<u>1.09</u>	<u>3.8</u>		
4.	Total Tax	0.57	2.13	2.78	2.14	1.80	3.24	11.62	24.3		
5.	Percentage Distribution	2.3	8.8	11.4	8.8	7.4	13.3	47.9	100.0		
Alternate Cases											
6.	Case A	-	0.21	0.32	0.47	0.32	0.85	19.11	21.3		
7.	Case B	0.98	3.30	4.11	2.96	2.49	4.28	5.76	23.9		
8.	Case C	-	0.04	0.06	0.09	0.06	0.17	3.83	4.3		
	(a) Stockholders	-	0.04	0.06	0.09	0.06	0.17	3.83	4.3		

TABLE A-6 continued

Line	Item	Less than \$1,000-										Total
		\$1,000	\$1,999	\$2,000-	\$2,999	\$3,000-	\$3,999	\$4,000-	\$4,999	\$5,000-	\$7,500 and over	
(b)	Consumers	0.69	2.31	2.88	2.07	1.74	2.99	4.03	16.7			
(c)	Wage-Earners	0.08	0.39	0.59	0.47	0.43	0.76	1.09	3.8			
(d)	Total Tax	0.77	2.74	3.53	2.63	2.23	3.92	8.95	24.8			
9.	Case D	-	0.38	0.57	0.84	0.57	1.52	34.12	38.0			
10.	Case E	1.56	5.24	6.54	4.71	3.95	6.80	9.16	38.0			

Note: Details may not sum to totals due to rounding.

Sources:

Lines 1 to 5--This is the Standard Case for measuring the incidence of the Puerto Rican corporate income tax. It assumes that of the corporate tax of \$38 million 40 percent is absorbed by profits, 50 percent is shifted forward to consumers, and 10 percent is shifted backward to wage earners; this would amount to \$15.2 million on profits, \$19 million on consumers, and \$3.8 million on wage earners. However, Puerto Rico's open economy necessitates further adjustments since it is assumed that a portion of the tax is exported to non-residents. Given that approximately 44 percent of total investment is held by non-residents it is assumed that 44 percent of the portion falling on profits is exported, leaving \$8.51 million to fall on resident stockholders; consequently, this figure is distributed according to dividends received by resident shareholders, Table A-1, Line 10. Additionally, given that only 62.9 percent of gross domestic product is bought in Puerto Rico, \$11.97 million

TABLE A-6 completed

\$19 million times 0.629) is assumed to burden consumers and is distributed according to total consumption, Table A-1, Line 15. Line 3 is distributed according to wage and salary income, Table A-1, Line 1. Line 4 is the sum of Lines 1-3; line 5 represents a percentage distribution of Line 4.

Line 6--Case A assumes that the entire tax falls on profits; that is, it is not shifted. Again, 44 percent is deducted, leaving \$21.28 million to be distributed according to dividends received by residents, Table A-1, Line 10.

Line 7--Case B assumes that the entire tax falls on consumption; that is, it is shifted forward 100 percent. 37.1 percent is deducted and the remainder--\$23.9 million--is distributed according to total consumption, Table A-1, Line 15.

Line 8--Case C assumes 20 percent is absorbed by profits, 10 percent by wage earners, and 70 percent by consumers. The adjustments to allow for tax exportation are made as in the Standard Case and the totals are distributed by the same distributive series.

Line 9--Case D assumes the entire tax is borne by Puerto Rican stockholders and is distributed according to dividends received by residents, Table A-1, Line 10.

Line 10--Case E assumes the entire tax is shifted to Puerto Rican consumers and is distributed according to total consumption, Table A-1, Line 15.

TABLE A-7

DISTRIBUTION OF LICENSE AND COMMODITY TAXES, 1963  
(millions of dollars)

Line	Item	Less than \$1,000	\$1,000-\$1,999	\$2,000-\$2,999	\$3,000-\$3,999	\$4,000-\$4,999	\$5,000-\$7,500	\$7,500 and over	Total
1.	Alcoholic Beverages	0.84	4.56	6.87	5.16	1.94	6.23	7.91	33.5
2.	Tobacco Products	1.78	6.52	5.27	3.54	2.61	3.54	3.33	26.6
3.	Petroleum Products	0.36	1.33	2.28	2.40	2.11	4.36	5.96	18.8
4.	Motor Vehicles and Parts	0.16	0.80	1.74	2.33	2.02	4.88	7.68	19.6
5.	Electric and Gas Appliances	0.17	0.76	1.60	0.86	0.77	1.20	1.43	6.8
6.	Others	0.42	1.42	1.77	1.28	1.07	1.84	2.48	10.3
7.	Total, Internal Excises	3.73	15.39	19.53	15.57	10.52	22.05	28.79	115.6
8.	Percentage Distribution	3.2	13.3	16.9	13.5	9.1	19.1	24.9	100.0
9.	Customs Duties	0.50	1.68	2.10	1.51	1.27	2.18	2.94	12.3

TABLE A-7 continued

Line	Item	Less than \$1,000	\$1,000-\$1,999	\$2,000-\$2,999	\$3,000-\$3,999	\$4,000-\$4,999	\$5,000-\$7,499	\$7,500 and over	Total
10.	Percentage Distribution	4.1	13.8	17.2	12.4	10.4	17.9	24.1	100.0
11.	Total, Excises and Duties	4.23	17.07	21.63	17.08	11.79	24.23	31.73	127.8
12.	Percentage Distribution	3.3	13.5	17.1	13.5	9.3	19.1	25.0	100.0
13.	Motor Vehicle Licenses	0.09	0.43	0.93	1.22	1.06	2.56	4.01	10.3
14.	Other Licenses	0.08	0.28	0.34	0.25	0.21	0.36	0.48	2.0
15.	Total, Licenses	0.17	0.71	1.27	1.47	1.27	2.92	4.49	12.3
16.	Percentage Distribution	1.4	5.8	10.3	12.0	10.3	23.7	36.5	100.0
17.	Municipal Taxes	0.17	0.57	0.71	0.51	0.43	0.73	0.99	4.1
18.	Percentage Distribution	4.1	13.9	17.3	12.4	10.5	17.8	24.1	100.0

Note: Details may not sum to totals due to rounding.

Sources:

The totals for the internal excises, customs duties, and licenses, arithmetic averages of fiscal years 1963 and 1964, are taken from Departamento de Hacienda de Puerto Rico,

TABLE A-7 continued

Informe Anual del Secretario de Hacienda, 1969 (San Juan: 1969), pp. 15-16. The municipal taxes are calculated from data presented in Departamento de Hacienda de Puerto Rico, Administración de Asuntos Financieros, Negociado de Asuntos Municipales, Informe Anual del Negociado de Asuntos Municipales, fiscal years 1963 and 1964 (San Juan: 1963 and 1964), Table 16(d) in each publication. Each total applicable to the internal excises is reduced by 4.8 percent, the proportion of tourist expenditures to total personal consumption expenditures. This portion is considered exported since tourists are non-residents.

Line 1--The total is distributed according to the percentage distribution of consumer expenditures on alcoholic beverages, Table A-17, Line 4.

Line 2--The total is distributed according to the percentage distribution of consumer expenditures on tobacco products, Table A-17, Line 5.

Line 3--59 percent of the total is distributed according to expenditures on gasoline by private autos, Table A-17, Line 11(b); 41 percent is distributed according to total consumption (Table A-1, Line 15) since this portion is assumed to fall on business vehicles and passed forward to the consumer. These proportions are taken from data developed in A. Gómez Vallés, El impacto de los arbitrios en la distribución del ingreso de Puerto Rico en el año 1963, University of Puerto Rico M.A. thesis, 1968, pp. 148-150. The author obtained data on the number of gallons of gasoline and diesel oil subject to excises in 1963, estimated the number of gallons of gasoline consumed by private autos, took the ratio of gallons of gas consumed by private autos to total gallons of gas paying excises (0.59), and assumed that of the total excises received from petroleum products 59 percent were derived from petroleum products utilized by private autos.

Line 4--86.1 percent of the total is distributed according to expenditures on private autos and the remainder by total consumption (the former distributive series is found in Table A-17, Line 11(a), the latter in Table A-1, Line 15). Again the proportions are taken from the Gómez Vallés study cited in Line 3 above (pp. 150-151).

TABLE A-7 continued

The author broke down total excise collections on motor vehicles into three categories: automobiles, parts, and other vehicles (trucks, buses, ambulances, and tractors). The ratio of private autos to total autos (private plus non-private) was found to be 0.94, and it was therefore assumed that 94 percent of the collected excises on automobiles and parts were derived from private-use autos. The remainder, the 6 percent plus excises levied on other vehicles, was again considered as derived from vehicles used for business purposes and thus distributed by total consumption. Line 5--The total is distributed according to the percentage distribution of consumer expenditures on electric and gas appliances, Table A-17, Line 13.

Line 6--Since this item comprises excises taxes from a large number of taxable goods it is distributed according to total consumption, Table A-1, Line 15.

Line 7--Sum of Lines 1-6.

Line 8--Percentage distribution of Line 7.

Line 9--Distributed according to total consumption, Table A-1, Line 15.

Line 10--Percentage distribution of Line 9.

Line 11--Sum of Lines 7 and 9.

Line 12--Percentage distribution of Line 11.

Line 13--Motor vehicle license taxes in 1963 vary directly with the value of the vehicle. Due to the lack of data showing the relation between income class and license tax payments the total is distributed 85 percent on the basis of expenditures on private autos (Table A-17, Line 11(a)) and 15 percent on the basis of total consumption, Table A-1, Line 15.

Line 14--Distributed according to total consumption (Table A-1, Line 15) since "other" licenses are composed of fees applicable to certain retail and wholesale distributors and producers of alcoholic beverages (among others) and are assumed to be shifted forward.



TABLE A-7 completed

Line 15--Sum of Lines 13 and 14.

Line 16--Percentage distribution of Line 15.

Line 17--Distributed according to total consumption (Table A-1, Line 15), since approximately 90 percent of the total is composed of gross receipts--patentes--and slaughterhouse taxes, levies which are assumed to be shifted forward in their entirety.

Line 18--Percentage distribution of Line 17.

TABLE A-8

EFFECTIVE EXCISE TAX RATES, BY TYPE OF EXCISE, 1963  
(broad income base)

Line	Taxed Item	Less than \$1,000- \$2,000- \$3,000- \$4,000- \$5,000- \$7,500									
		\$1,000	\$1,999	\$2,999	\$3,999	\$4,999	\$7,499	and over	Total	Percentages	
1.	Alcoholic Beverages	1.1	1.8	2.1	2.2	0.9	1.7	1.1	1.5		
2.	Tobacco Products	2.3	2.5	1.6	1.5	1.2	1.0	0.5	1.2		
3.	Petroleum Products	0.5	0.5	0.7	1.0	1.0	1.2	0.8	0.9		
4.	Motor Vehicles and Parts	0.2	0.3	0.5	1.0	0.9	1.4	1.0	0.9		
5.	Electric and Gas Appliances	0.2	0.3	0.5	0.4	0.4	0.3	0.2	0.3		
6.	Others	<u>0.6</u>	<u>0.5</u>	<u>0.5</u>	<u>0.5</u>	<u>0.5</u>	<u>0.5</u>	<u>0.3</u>	<u>0.5</u>		
7.	Total	4.9	6.0	6.0	6.5	4.9	6.1	3.9	5.2		

Note: Details may not sum to totals due to rounding.

## Source:

Each line of this table is derived by expressing Lines 1-7 of Table A-7 as a percentage of broad income, Table A-2, Line 8.

TABLE A-9

INTERNAL EXCISE TAX DISTRIBUTION FOR ALTERNATIVE SHIFTING ASSUMPTIONS, 1963  
(millions of dollars)

Line	Item	Less than \$1,000	\$1,000-\$1,999	\$2,000-\$2,999	\$3,000-\$3,999	\$4,000-\$4,999	\$5,000-\$5,999	\$7,000 and over	Total
1.	Alternative A	3.4	14.4	18.9	15.1	10.7	21.6	31.4	115.6
2.	Alternative B	3.0	13.0	18.0	14.2	11.0	21.1	35.4	115.6
3.	Alternative C	2.2	10.6	16.4	12.8	11.4	20.1	42.1	115.6
Effective Internal Excise Tax Rates, Broad Income Base (percentages)									
4.	Alternative A	4.5	5.5	5.8	6.3	5.0	6.0	4.3	5.2
5.	Alternative B	3.9	5.0	5.5	6.0	5.1	5.9	4.8	5.2
6.	Alternative C	2.9	4.1	5.0	5.5	5.3	5.6	5.7	5.2

## Sources:

Line 1--Alternative A assumes that 20 percent of all internal excise taxes are shifted to the factors of production; as a result \$23.1 million is distributed according to factor income (Table A-1, Line 36) while the remaining \$92.5 million is distributed by the distributive series for each product group subject to the excise levies (Table A-17).

Line 2--Alternative B assumes that 50 percent of all excises are shifted to the factors; \$57.8 million is allocated by factor income and \$57.8 million is distributed by the appropriate series.

Line 3--Alternative C assumes that all excises are shifted backward; consequently, \$115.6 million is distributed according to factor income.

Lines 4 to 6--Lines 1-3 expressed as a percentage of broad income.

TABLE A-10

DISTRIBUTION OF PROPERTY TAX COLLECTIONS, 1963  
(millions of dollars)

Line	Tax Base	Less than \$1,000	\$1,000-\$1,999	\$2,000-\$2,999	\$3,000-\$3,999	\$4,000-\$4,999	\$5,000-\$7,499	\$7,500 and over	Total
1.	Real Property, Total	<u>0.46</u>	<u>1.64</u>	<u>2.11</u>	<u>1.69</u>	<u>1.56</u>	<u>3.04</u>	<u>6.90</u>	<u>17.4</u>
2.	Business--Land	-	0.03	0.05	0.07	0.05	0.12	2.78	3.1
3.	Business--Buildings, Machinery, Other Assets	0.33	1.12	1.39	1.00	0.84	1.45	1.95	8.1
4.	Owner-Occupied Residences	0.06	0.26	0.31	0.32	0.43	1.03	1.69	4.1
5.	Renter-Occupied Residences	0.07	0.23	0.36	0.30	0.24	0.43	0.47	2.1
6.	Personal Property, Total	<u>0.15</u>	<u>0.52</u>	<u>0.75</u>	<u>0.57</u>	<u>0.46</u>	<u>0.79</u>	<u>2.76</u>	<u>6.0</u>
7.	Corporations and Partnerships	0.09	0.35	0.46	0.35	0.30	0.53	1.91	4.0
8.	Proprietorships	<u>0.05</u>	<u>0.17</u>	<u>0.29</u>	<u>0.22</u>	<u>0.16</u>	<u>0.26</u>	<u>0.85</u>	<u>2.0</u>

TABLE A-10 continued

Line	Tax Base	Less than \$1,000- \$2,000- \$3,000- \$4,000- \$5,000- \$7,500							
		\$1,000	\$1,999	\$2,999	\$3,999	\$4,999	\$7,499	and over	Total
9. Total		0.61	2.16	2.86	2.26	2.02	3.83	9.66	23.4
10. Percentage Distribution		2.6	9.2	12.2	9.6	8.6	16.4	41.3	100.0

Note: Details may not sum to totals due to rounding.

#### Sources:

The methodology underlying the property tax disaggregation is described on text pages 71-76. The source of the initial combined central government-municipal government property tax collection total of \$32.9 million is work sheets of the Office of Economic and Financial Studies of the Puerto Rican Department of the Treasury.

Line 1--Sum of Lines 2-5.

Line 2--That portion of the tax assumed to fall on business land--\$3.1 million--is postulated to be non-shiftable and to therefore fall entirely on business profits; it is distributed according to dividends received by residents, Table A-1, Line 10.

Line 3--That portion of the tax assumed to fall on business assets--\$8.1 million--is postulated to be shifted forward in its entirety; it is distributed according to total consumption, Table A-1, Line 15.

Line 4--That portion of the tax assumed to fall on owner-occupied residences--\$4.1 million--is postulated to be non-shiftable and is distributed according to expenditures on owned dwellings, Table A-17, Line 16.

Line 5--That portion of the tax assumed to fall on renter-occupied residences--\$2.1 million--is postulated to burden the renter and is distributed according to rent paid, Table A-1, Line 17.

TABLE A-10 completed

Line 6--Sum of Lines 7 and 8.

Line 7--That portion of the personal property tax--\$4.0 million--assumed to fall on corporations and partnerships is distributed according to the corporation Standard Case assumptions; that is, 40 percent burdens profits and is distributed by dividends received by residents (Table A-1, Line 10), 10 percent burdens factors and is distributed by wages and salaries (Table A-1, Line 1), and 50 percent burdens consumers and is distributed by total consumption (Table A-1, Line 15).

Line 8--That portion of the personal property tax--\$2.0 million--assumed to fall on proprietorships is distributed according to the net income of unincorporated business, Table A-1, Line 2.

Line 9--Sum of Lines 1 and 6.

Line 10--Percentage distribution of Line 9.

TABLE A-11

SOCIAL INSURANCE CONTRIBUTIONS, 1963  
(millions of dollars)

<u>Line</u>	<u>Fund</u>	<u>Employer Contribution</u>	<u>Employee Contribution</u>	<u>Total</u>
	Federal	35.4	36.9	72.3
1.	OASDI	29.2	33.5	62.7
2.	Unemployment	3.3		3.3
3.	Others <sup>a</sup>	2.9	3.4	6.3
	Commonwealth	51.8	17.8	69.6
4.	State Insurance Fund	20.9		20.9
5.	Unemployment	18.3		18.3
6.	Retirement--Public Employees <sup>b</sup>	11.1	10.6	21.7
7.	Others <sup>c</sup>	<u>1.5</u>	<u>7.2</u>	<u>8.7</u>
	Total	87.2	54.7	141.9

<sup>a</sup>Federal Civil Service and Premiums of National Service Life Insurance.

<sup>b</sup>Retirement System of Commonwealth Government Employees, Teacher's Pension Fund, University of Puerto Rico Pension Fund, and Judiciary Retirement System.

<sup>c</sup>Chauffeur's Social Security, Savings and Loan Fund of the Commonwealth Government Employees, and Disability or Death Insurance Fund.

Source:

Work sheets of the Junta de Planificación, Negociado de Análisis Económico y Social, División de Cuentas Sociales.



TABLE A-12

DISTRIBUTION OF SOCIAL INSURANCE CONTRIBUTIONS, 1963  
(millions of dollars)

Line	Fund	Less than \$1,000-\$1,000	\$1,000-\$1,999	\$2,000-\$2,999	\$3,000-\$3,999	\$4,000-\$4,999	\$5,000-\$7,499	\$7,500 and over	Total
Federal Funds									
1.	OASDI	1.98	8.78	12.52	9.67	8.60	10.55	10.55	62.7
2.	Unemployment	0.12	0.46	0.61	0.46	0.39	0.57	0.69	3.3
3.	Others	0.13	0.65	0.98	0.77	0.71	1.25	1.81	6.3
Commonwealth Funds									
4.	State Insurance Fund	0.73	2.67	3.50	2.58	2.23	3.87	5.33	20.9
5.	Unemployment	0.64	2.34	3.06	2.27	1.95	3.38	4.67	18.3
6.	Public Retirement Systems	0.21	1.09	1.65	1.30	1.20	2.11	3.04	10.6
7.	Others	0.14	0.74	1.12	0.89	0.81	1.43	2.07	7.2
8.	Total	3.95	16.73	23.44	17.94	15.89	23.16	28.16	129.3

Note: Details may not sum to totals due to rounding.

TABLE A-12 continued

## Source:

The totals to be allocated among income classes are taken from Table A-11. It will be noted that the sum total of social insurance contributions in Table A-11 is greater than the sum total distributed here. The reason for this divergence is explained in Line 6 below.

Line 1--It is assumed that 70 percent of the employer's contribution is shifted forward and is distributed according to total consumption, Table A-1, Line 15. The remaining 30 percent of the employer's contribution and all employee contributions are assumed borne by the employee himself and are distributed according to "covered" wages and salaries, Table A-1, Line 21.

Line 2--The employer's contribution is distributed under assumptions exactly similar to those in Line 1.

Line 3--The total is distributed according to wages and salaries (Table A-1, Line 1); that is, it is assumed that the employer's contribution is entirely shifted backward and that the employee contribution is non-shiftable.

Line 4--The employer's contribution--the total--is assumed to be shifted forward 70 percent and is distributed by total consumption (Table A-1, Line 15), while the remaining 30 percent is assumed shifted backward and is distributed by wages and salaries, Table A-1, Line 1.

Line 5--The employer's contribution is distributed under assumptions exactly similar to those in Line 4 above.

Line 6--The employee contribution is assumed to be non-shiftable and is distributed by wages and salaries, Table A-1, Line 1. It is assumed that the employer's contribution is not shifted since the employer is government. As Gillespie notes the employer's share does not have to be allocated since it will "appear inseparable from the budget deficit or surplus; the distribution will be similar to the average tax payment." Refer to W. Irwin Gillespie, The Incidence of Taxes and Public Expenditures in the

TABLE A-12 completed

Canadian Economy, Study No. 2 of the Royal Commission on Taxation (Ottawa: Queen's Printer, 1966), p. 56. On this basis the employer contribution of \$11.1 million is ignored and not distributed. It will be noted that the employer's share under "Other" federal funds (Line 3) is distributed even though the employer is government. In this case, however, the employer is the U.S. government, and the Gillespie argument that the employer's contribution is "inseparable from the budget deficit or surplus" does not apply since this study deals with the fiscally autonomous Puerto Rican budget.

Line 7--The employee contribution is distributed by wages and salaries, Table A-1,  
 Line 1. The employer share is not distributed due to the argument described in Line  
 6 above.

Line 8--Sum of Lines 1-7.

TABLE A-13  
DISTRIBUTION OF THE FAMILIES,<sup>a</sup> 1963

<u>Family Money Income Class</u>	<u>Number of Families<sup>b</sup></u>	<u>Percentage Distribution</u>
Less than \$1,000	76,987	16.7
\$1,000-\$1,999	120,782	26.2
\$2,000-\$2,999	97,732	21.2
\$3,000-\$3,999	51,171	11.1
\$4,000-\$4,999	35,036	7.6
\$5,000-\$7,499	43,795	9.5
<u>\$7,500 and over</u>	<u>35,497</u>	<u>7.7</u>
Total	461,000	100.0

<sup>a</sup>Exclusive of unattached individuals.

<sup>b</sup>Numbers are slightly adjusted to sum exactly to the total.

Source:

Department of Labor of Puerto Rico, Income and Expenditures of the Families, Puerto Rico, 1963, Report 1-A, Income of All Families (San Juan: February, 1967), p. 6.

TABLE A-14  
DISTRIBUTION OF UNATTACHED INDIVIDUALS, 1963

<u>Family Money Income Class</u>	<u>Number of Individuals<sup>a</sup></u>	<u>Percentage Distribution</u>
Less than \$1,000	24,687	63.3
\$1,000-\$1,999	7,488	19.2
\$2,000-\$2,999	2,613	6.7
\$3,000-\$3,999	1,911	4.9
\$4,000-\$4,999	1,326	3.4
\$5,000-\$7,499	749	1.9
<u>\$7,500 and over</u>	<u>187</u>	<u>0.5</u>
Total	39,000	100.0

<sup>a</sup>Does not sum to total because the number in each class is calculated by taking a rounded percentage of the total. It is arbitrarily assumed that 80 percent of the individuals in the published "\$5,000 and over" class (the highest one given) fall within the \$5,000-\$7,499 family money income class.

Source:

Department of Labor of Puerto Rico, Income and Expenditures of the Families, Puerto Rico, 1963, Report 1-C, Income of Non-Wage Earners' Families (San Juan: March, 1967), p. 57.

TABLE A-15

DISTRIBUTION OF TRANSFER PAYMENTS, 1963  
(millions of dollars)

Line	Transfer	Less than \$1,000	\$1,000	\$1,999	\$2,999	\$3,999	\$4,000-\$4,999	\$5,000-\$7,499	\$7,500 and over	Total
<b>Federal Transfers</b>										
1.	OASDI and Others	9.55	26.33	15.82	9.47	5.15	5.07	3.21		74.6
2.	Veterans	0.95	6.97	7.01	5.66	4.64	5.95	5.22		36.5
<b>Commonwealth Transfers<sup>a</sup></b>										
3.	Pensions	0.17	1.02	1.89	0.49	0.53	0.89	3.21		8.2
4.	Relief Grants	7.69	5.82	4.17	0.47	0.21	0.36	-		18.7
5.	Unemployment Compensation	1.77	4.51	2.76	0.33	1.52	0.50	-		11.4
6.	State Insurance Fund <sup>b</sup>	0.22	1.33	2.46	0.64	0.70	1.17	4.18		10.7
7.	Total, Government Transfers	20.35	45.98	34.11	17.06	12.75	13.94	15.82		160.1

TABLE A-15 continued

Line	Transfer	Less than \$1,000- \$2,000- \$3,000- \$4,000- \$5,000- \$7,500									
		\$1,000	\$1,999	\$2,999	\$3,999	\$4,999	\$7,499	and over	Total		
8.	Percentage Distribu- tion	12.7	28.7	21.3	10.7	8.0	8.7	9.9	100.0		
9.	Business	0.61	2.06	2.56	1.85	1.55	2.67	3.59	14.9		
10.	Remittances from the Rest of the World	<u>11.19</u>	<u>21.95</u>	<u>13.52</u>	<u>4.39</u>	<u>7.65</u>	<u>9.42</u>	<u>2.76</u>	<u>70.8</u>		
11.	Total, All Transfers	32.15	69.99	50.19	23.30	21.95	26.03	22.17	245.8		
12.	Percentage Distribu- tion	13.1	28.6	20.4	9.4	8.9	10.6	9.0	100.0		

Note: Details may not sum to totals due to rounding.

aExcludes several minor Commonwealth government transfers for which distributive series are not available.

bThe total figure distributed differs from government expenditures on transfers by the amount of goods and services provided by the State Insurance Fund. For an explanation of this latter amount see text pages 162-163.

Source:

The totals are taken from work sheets of the National Accounts Division of the Planning Board, and represent the arithmetic mean of fiscal years 1963 and 1964. They are distributed according to the following series found in Table A-1:

TABLE A-15 completed

Line 1--Social Security Receipts (OASI only); "other" transfers comprise only 3 percent of the \$74.6 million total, so that distribution by the OASI series does not appreciably affect the results.

Line 2--Receipts from military service.

Line 3--Other Government Pensions and Retirement Benefits.

Line 4--Public Assistance and Private Charity.

Line 5--Unemployment Insurance Benefits.

Line 6--Other Government Pensions and Retirement Benefits.

Line 7--Sum of Lines 1-6.

Line 8--Percentage distribution of Line 7.

Line 9--Total Consumption; the rationale behind the use of this series is that business transfers include, in part, bad debts.

Line 10--Cash Contributions from Persons Outside Family; the rationale in this case is that most of these remittances come from Puerto Ricans living off the island.

Line 11--Sum of Lines 7, 9, and 10.

Line 12--Percentage distribution of Line 11.



TABLE A-16

PUBLIC TRANSFER PAYMENTS DISTRIBUTION RELATIVE TO THE NEWMAN PROCEDURE,<sup>a</sup> 1963  
(millions of dollars)

Line	Transfer	Less than \$1,000- \$1,000	\$1,000-\$2,999	\$2,000-\$3,000- \$3,999	\$3,000-\$4,000- \$4,999	\$4,000-\$5,000- \$5,999	\$5,000-\$7,499	\$7,499 and over	Total
1. Federal OASDI	9.24	25.49	15.31	9.17	4.98	4.91	3.10	72.2	
2. Commonwealth Relief Grants <sup>c</sup>	7.69	5.82	4.17	-	-	-	-	17.7	
3. Commonwealth Unemployment Compensation	1.77	4.51	2.76	0.33	1.52	0.50	-	11.4	
4. Commonwealth State Insurance Fund	0.22	1.33	2.46	0.64	0.70	1.17	4.18	10.7	
5. Total <sup>b</sup>	18.92	37.25	24.70	10.14	7.20	6.58	7.28	112.0	
6. Percentage Distribution	16.9	33.3	22.1	9.1	6.4	5.9	6.5	100.0	

<sup>a</sup>These public transfers do not include all public transfers, but only those which are excluded from personal gross income. The only value of this table is its use in the Newman adjustment procedure.

<sup>b</sup>Details may not sum to totals due to rounding.  
<sup>c</sup>It is assumed that relief grants, although not legally an exclusion, are included in the family money income of the three lowest brackets but are simply "lost" for income tax purposes; that is, they represent a de facto exclusion.

Sources:

Totals are taken from Junta de Planificación, Negociado de Análisis Económico y Social, División de Cuentas Sociales, work sheets; the totals are averages of fiscal years 1963 and 1964 and are distributed according to the following distributive series found in

Table A-1:

- Line 1--Social Security Receipts (OASI only).
- Line 2--Public Assistance and Private Charity.
- Line 3--Unemployment Insurance Benefits.
- Line 4--Other Government Pensions and Retirement Benefits.
- Line 5--Sum of Lines 1-4.
- Line 6--Percentage distribution of Line 5.

TABLE A-17  
PERCENTAGE DISTRIBUTION OF CONSUMER EXPENDITURES BY INCOME CLASSES, 1963

Line	Item	(Percentages)										Total
		Less than \$1,000	\$1,000-\$1,999	\$2,000-\$2,999	\$3,000-\$3,999	\$4,000-\$4,999	\$5,000-\$7,500	\$7,500-\$10,000	\$10,000-\$15,000	\$15,000-\$25,000	\$25,000 and over	
1.	Housing	3.7	10.8	14.2	10.8	10.3	20.1	30.0	100			
2.	Household Furnishings and Equipment	3.3	14.3	19.6	12.7	11.4	16.9	21.7	100			
3.	Food	5.9	18.1	20.9	13.2	10.1	15.2	16.6	100			
4.	Alcoholic Beverages	2.5	13.6	20.5	15.4	5.8	18.6	23.6	100			
5.	Tobacco	6.7	24.5	19.8	13.3	9.8	13.3	12.5	100			
6.	Personal Care	6.4	16.4	19.4	11.5	10.4	16.7	19.2	100			
7.	Clothing	3.8	14.9	17.1	12.8	11.9	19.2	20.3	100			
8.	Medical Care	2.5	10.5	16.8	13.8	11.2	17.2	28.0	100			
9.	Recreation	2.3	9.8	14.2	11.6	11.9	20.1	30.3	100			
10.	Reading and Education	0.7	3.7	6.8	7.6	10.1	21.2	50.1	100			
11.	Transportation	1.5	6.6	11.1	12.1	10.0	22.7	36.0	100			
	(a) Private Auto	0.3	2.5	7.5	11.8	10.3	26.0	41.6	100			
	(b) Gas-Private Auto	0.4	2.4	8.6	13.0	11.8	26.9	37.0	100			

12.	Other (Miscellaneous)	2.7	9.3	14.1	8.9	9.0	16.8	39.3	100
13.	Gas and Electric Appliances	2.5	11.2	23.6	12.7	11.3	17.6	21.1	100
14.	Auto Purchases	0.1	3.1	7.4	11.5	9.3	25.8	42.9	100
15.	Auto Operating	0.5	1.9	7.7	12.5	11.6	26.2	39.6	100
16.	Owned Dwelling plus Repairs and Replacements	1.5	6.3	7.6	7.7	10.4	25.2	41.3	100
17.	Rent Paid	3.2	11.0	17.2	14.3	11.6	20.5	22.2	100
18.	Total Consumption	4.1	13.8	17.2	12.4	10.4	17.9	24.1	100

## Source:

Department of Labor of Puerto Rico, Income and Expenditures of the Families, Puerto Rico, 1963, Report 4-A, Expenditures of All Families (San Juan: November, 1967), pp. 38-47.

For each income class the average family expenditure by item is given. This average is multiplied by the number of families in each class (exclusive of unattached individuals) to derive absolute expenditure series from which the relative expenditure series of the table are computed. For more complete definitions of several of the componential items see Ibid., pp. v-vi.

TABLE A-18

PUERTO RICAN CENTRAL GOVERNMENT EXPENDITURES  
BY FUNCTIONAL CATEGORY, FISCAL YEARS 1963 AND 1964  
(millions of dollars)

<u>Line</u>	<u>Functional Category</u>	<u>Fiscal 1963</u>	<u>Fiscal 1964</u>	<u>Mean</u>
1.	Education	109.5	124.1	116.8
2.	Health	48.0	51.0	49.5
3.	Public Welfare	17.7	19.5	18.6
4.	Agriculture	18.7	18.4	18.6
5.	Labor Relations	4.4	4.8	4.6
6.	Transportation and Communication	32.6	31.8	32.2
7.	Housing	9.7	7.5	8.6
8.	Pensions and Social Security	104.5	113.9	109.3
	(a) Commonwealth	36.1	38.1	37.1
	(b) OASDI Benefits	68.6	75.8	72.2
9.	Interest Payments	8.5	9.6	9.1
10.	General Expenditures	84.9	96.8	90.8
	(a) Legislative	3.6	3.7	3.6
	(b) Judicial	5.8	7.0	6.4
	(c) Executive	25.4	28.0	26.7
	(d) Protection-Persons and Property	25.3	30.4	27.8
	(e) Industrial Development	8.2	10.0	9.1
	(f) Commercial Development	0.6	2.0	1.3
	(g) Cooperative Promotion	1.0	1.3	1.2
	(h) Land Conservation	10.0	10.0	10.0
	(i) Recreation	4.1	4.2	4.1
	(j) Non-Classified Services	0.9	0.2	0.6
11.	Total Expenditures	<u>438.7</u>	<u>477.4</u>	<u>458.1</u>
12.	Total, Excluding OASDI	<u>370.1</u>	<u>401.6</u>	<u>385.9</u>

Source: Table A-19.

TABLE A-19

COMPONENTS OF THE FUNCTIONAL EXPENDITURE CATEGORIES OF THE  
PUERTO RICAN CENTRAL GOVERNMENT, FISCAL YEARS 1963 AND 1964  
(in dollars)

<hr/> <hr/>			
I Education			
	<u>Fiscal 1963</u>	<u>Fiscal 1964</u>	
1. Department of Education	74,665,318	88,846,095	
2. University of Puerto Rico	24,885,805	24,924,355	
3. Personnel Office-Training Program	275,920	275,321	
4. Health Department Scholarships	25,000	25,000	
5. Commerce Department Scholarships	-	30,000	
6. Grants to the Puerto Rican Institute of Culture <sup>a</sup>	595,155	841,000	
7. Grants to the Industrial Development Corporation	460,000	490,000	
8. Cultural Programs for Industrial Workers	87,820	91,335	
9. State Department Programs	20,000	20,000	
10. Agriculture Department Museum	7,666	8,620	
11. Interest Payments	6,000	7,500	
12. Donations	<u>75,856</u>	<u>30,000</u>	
13. Total, Current Outlays	101,104,540	115,589,226	
14. Capital Expenditures	<u>8,400,000</u>	<u>8,500,000</u>	
15. Grand Total	109,504,540	124,089,226	
II Health			
	<u>Fiscal 1963</u>	<u>Fiscal 1964</u>	
1. Department of Health	29,998,103	35,898,626	
2. Doctors for Municipal Welfare	42,651	39,808	
3. Appropriations to the Aqueduct and Sewer Authority	835,600	799,600	
4. School Lunch Programs	7,119,433	8,224,214	
5. Donations	<u>17,100</u>	<u>17,100</u>	
6. Total, Current Outlays	38,012,887	44,979,348	
7. Capital Expenditures	<u>10,000,000</u>	<u>6,000,000</u>	
8. Grand Total	48,012,887	50,979,348	

TABLE A-19 continued

## III Public Welfare

	<u>Fiscal 1963</u>	<u>Fiscal 1964</u>
1. Department of Health	13,302,660	14,156,145
2. Child's Commission	33,916	42,507
3. Commission for the Improvement of Isolated Communities	213,972	330,643
4. Grants to the Manpower Development Administration	700,000	1,000,000
5. Department of Education	273,954	245,578
6. Grants to the Urban Renewal Corporation	791,500	859,000
7. Veteran's Office--Department of Labor	27,813	29,048
8. Donations	<u>244,040</u>	<u>309,200</u>
9. Total, Current Outlays	15,587,855	16,972,121
10. Capital Expenditures	<u>2,129,300</u>	<u>2,529,300</u>
11. Grand Total	17,717,155	19,501,421

## IV Agriculture

	<u>Fiscal 1963</u>	<u>Fiscal 1964</u>
1. Agricultural Council	142,558	132,923
2. Department of Agriculture	6,007,464	4,461,503
3. Sugar Board	134,471	147,110
4. Agricultural Experimental Station	1,996,691	2,407,336
5. Agricultural Extension Service	1,005,213	1,277,443
6. Coffee Export Subsidies	2,999,871	1,250,000
7. Grants to Land Authority <sup>a</sup>	1,742,000	1,812,000
8. Grants to Agricultural Credit Corporation	1,212,624	1,435,100
9. Grants to the Water Resources Authority <sup>a</sup>	260,046	433,324
10. Grants to the U.S. Experimental Station	59,531	56,588
11. Grants for Rural Electrification <sup>a</sup>	<u>1,226,000</u>	<u>1,263,286</u>
12. Total, Current Outlays	16,786,469	16,676,613
13. Capital Expenditures	<u>1,900,000</u>	<u>1,700,000</u>
14. Grand Total	18,686,469	18,376,613

TABLE A-19 continued

## V Labor Relations

	<u>Fiscal 1963</u>	<u>Fiscal 1964</u>
1. Department of Labor	4,169,828	4,628,458
2. Board of Labor Relations	<u>184,851</u>	<u>208,753</u>
3. Total, Current Outlays	4,354,679	4,837,211

## VI Transportation and Communication

	<u>Fiscal 1963</u>	<u>Fiscal 1964</u>
1. Department of Public Works	7,962,090	9,072,138
2. Grants to the Ports Authority <sup>a</sup>	839,000	1,100,000
3. Grants to the Communications Authority <sup>a</sup>	1,518,209	1,532,375
4. Grants to Ferry Service	<u>-</u>	<u>64,000</u>
5. Total, Current Outlays	10,319,299	11,768,513
6. Capital Expenditures	<u>22,261,789</u>	<u>20,000,000</u>
7. Grand Total	32,581,088	31,768,513

## VII Housing

	<u>Fiscal 1963</u>	<u>Fiscal 1964</u>
1. Urban Renewal Administration	254,069	271,635
2. Grants to the Urban Renewal Corporation <sup>a</sup>	6,700,000	4,646,500
3. Grants to the Housing Bank	500,000	-
4. Low-cost Housing--Department of Agriculture	<u>1,260,951</u>	<u>1,586,893</u>
5. Total, Current Outlays	8,715,020	6,505,028
6. Capital Expenditures	<u>1,000,000</u>	<u>1,000,000</u>
7. Grand Total	9,715,020	7,505,028

## VIII Pensions and Social Security

	<u>Fiscal 1963</u>	<u>Fiscal 1964</u>
1. Federal OASDI Benefits	68,600,000	75,800,000
2. Commonwealth, Total	<u>36,100,000</u>	<u>38,100,000</u>
(a) Pensions	7,600,000	8,800,000
(b) Unemployment Compensation	11,600,000	11,300,000



TABLE A-19 continued

## VIII Pensions and Social Security (continued)

	<u>Fiscal 1963</u>	<u>Fiscal 1964</u>
(c) State Insurance Fund-- Transfers	10,200,000	11,100,000
(d) State Insurance Fund-- Goods and Services	<u>6,700,000</u>	<u>6,900,000</u>
3. Total, Current Outlays	104,700,000	113,900,000

## IX Interest Payments

	<u>Fiscal 1963</u>	<u>Fiscal 1964</u>
1. Total, Current Outlays	8,533,000	9,637,000

## X Legislative

	<u>Fiscal 1963</u>	<u>Fiscal 1964</u>
1. Senate	936,947	956,508
2. House of Representatives	1,494,053	1,478,455
3. Joint Senate and House Activities	283,997	299,394
4. Controller's Office	<u>804,267</u>	<u>918,545</u>
5. Total, Current Outlays	3,519,264	3,652,902
6. Capital Expenditures	<u>33,000</u>	<u>-</u>
7. Grand Total	3,552,264	3,652,902

## XI Judicial

	<u>Fiscal 1963</u>	<u>Fiscal 1964</u>
1. Supreme Court	604,661	736,804
2. Courts Administrative Office	396,674	488,755
3. Superior Court	2,407,936	3,098,122
4. District Courts	1,582,169	2,084,768
5. Justices of the Peace	187,075	246,499
6. Special Programs	<u>20,000</u>	<u>81,302</u>
7. Total, Current Outlays	5,198,515	6,736,250
8. Capital Expenditures	<u>600,000</u>	<u>300,000</u>
9. Grand Total	5,798,515	7,036,250

## XII Executive

	<u>Fiscal 1963</u>	<u>Fiscal 1964</u>
1. Governor's Office	616,218	666,793
2. Budget Bureau	423,303	498,032
3. Planning Board	2,900,763	2,659,896
4. Transport Office	49,999	124,999
5. State Department	890,177	872,143
6. Resident Commissioner's Office	98,735	114,195
7. State Electoral Board	250,262	478,777
8. Primary Institute	98,659	38,168
9. Treasury Department	11,454,739	13,528,489
10. Personnel Office	623,826	702,778
11. Department of Justice-- Administration	1,159,842	1,306,173
12. Public Works	4,798,675	5,587,640
13. Financial Advice	30,000	30,000
14. Public Buildings Adminis- tration	110,000	193,000
15. Municipal Complaints Commission	4,486	5,534
16. General Purpose Appropriations	385,703	250,485
17. Diverse Appropriations	<u>10,500</u>	<u>479,520</u>
18. Total, Current Outlays	23,905,887	27,536,622
19. Capital Expenditures	<u>1,500,000</u>	<u>500,000</u>
20. Grand Total	25,405,887	28,036,622

## XIII Protection of Persons and Property

	<u>Fiscal 1963</u>	<u>Fiscal 1964</u>
1. Justice Department	4,520,646	5,304,332
2. Police Department	15,803,307	19,223,715
3. Fire Departments	1,476,536	1,649,115
4. Puerto Rican National Guard	451,386	503,902
5. Civil Defense Office	176,154	176,255
6. Public Service Commission	523,937	612,608
7. Economic Stabilization Administration	476,586	579,734
8. Board of Appeals on Con- struction and Zoning	92,335	102,004
9. Public Works	392,880	458,693
10. Penal Reform Commission	14,431	12,757
11. Civil Air Patrol	20,000	20,000
12. Planning Board--Permit Bureau	549,327	601,320

TABLE A-19 continued

## XIII Protection of Persons and Property (continued)

	<u>Fiscal 1963</u>	<u>Fiscal 1964</u>
13. Treasury Department-- Insurance Commissioner's Office	<u>219,663</u>	<u>258,656</u>
14. Total, Current Outlays	24,717,188	29,503,091
15. Capital Expenditures	<u>577,415</u>	<u>898,400</u>
16. Grand Total	25,294,603	30,401,491

## XIV Industrial Development

	<u>Fiscal 1963</u>	<u>Fiscal 1964</u>
1. Economic Development Administration	5,958,823	6,985,977
2. Office of Industrial Tax Exemption	73,642	82,886
3. Grants to the Industrial Development Company	1,475,000	2,246,000
4. Grants to the Water Resources Authority	-	33,000
5. Rum Pilot Plant	96,811	106,036
6. Mining Commission	<u>3,898</u>	<u>8,629</u>
7. Total, Current Outlays	7,608,174	9,462,528
8. Capital Expenditures	<u>600,000</u>	<u>500,000</u>
9. Grand Total	8,208,174	9,962,528

## XV Commercial Development

	<u>Fiscal 1963</u>	<u>Fiscal 1964</u>
1. Commerce Department	487,753	715,268
2. Grants to the Commercial Development Company	<u>100,000</u>	<u>140,000</u>
3. Total, Current Outlays	587,753	855,268
4. Capital Expenditures	<u>-</u>	<u>1,100,000</u>
5. Grand Total	587,753	1,955,268

TABLE A-19 continued

## XVI Cooperative Promotion

	<u>Fiscal 1963</u>	<u>Fiscal 1964</u>
1. Cooperative Development Administration	793,975	1,186,513
2. Grants to the Cooperative Bank	-	150,000
3. Total, Current Outlays	793,975	1,336,513
4. Capital Expenditures	200,000	-
5. Grand Total	993,975	1,336,513

## XVII Land Conservation

	<u>Fiscal 1963</u>	<u>Fiscal 1964</u>
1. Grants to the Land Administration	10,000,000	10,000,000
Since the total actually spent by the Land Administration is so vague it is decided to use the mean figure for each fiscal year; the total is considered capital expenditure.		

## XVIII Recreation

	<u>Fiscal 1963</u>	<u>Fiscal 1964</u>
1. Parks and Recreation Administration	1,665,112	2,225,055
2. Racing Administration	359,894	397,527
3. Grants to the Recreation Development Company	114,170	346,357
4. Total, Current Outlays	2,139,176	2,968,939
5. Capital Expenditures	1,937,000	1,220,000
6. Grand Total	4,076,176	4,188,939

## XIX Non-Classified Services

	<u>Fiscal 1963</u>	<u>Fiscal 1964</u>
1. Total, Current Outlays	134,002	209,009
2. Capital Expenditures	800,000	-
3. Grand Total	934,002	209,009

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<sup>a</sup>Includes capital expenditures.

TABLE A-19 completed

## Sources:

All components of the functional expenditure categories with the exception of interest payments and pensions and social security are taken from the published budgets of the Puerto Rican government for the fiscal years 1965 and 1966. The 1965 budget contains actual expenditure data for fiscal year 1963, as does the 1966 budget for fiscal year 1964. See Oficina del Gobernador, Negociado del Presupuesto, Presupuesto para el año fiscal de 1965 (1966) que propone el Gobernador a la Asamblea Legislativa del Estado Libre Asociado de Puerto Rico (San Juan: División de Imprenta del Departamento de Hacienda, 1964 and 1965). This author bears the responsibility for all item translations. Interest payments data are from Departamento de Hacienda de Puerto Rico, Informe Anual del Secretario de Hacienda, 1969 (San Juan: 1969), p. 21; pension and social security data are from work sheets, Junta de Planificación, Negociado de Análisis Económico y Social, División de Cuentas Sociales. Those current and capital budgetary expenditures financed by grants from the federal (United States) government are completely excluded when the data source permits. Capital expenditure figures are not precise but are the result of estimates arrived at by cross-checking budget data with the annual reports of the various government agencies and public corporations; it cannot be exactly verified that the capital expenditure sums presented in the table represent actual outlays during the given fiscal year, but they are thought to be fair estimates; moreover, the use of the mean of fiscal years 1963 and 1964 to represent calendar year 1963 may somewhat alleviate the rather rough nature of the estimates. The goods and services portion of the State Insurance Fund component of the pensions and social security category is taken from the cited budgets.

TABLE A-20

PUERTO RICAN MUNICIPAL GOVERNMENT EXPENDITURES  
BY FUNCTIONAL CATEGORY, FISCAL YEARS 1963 AND 1964  
(millions of dollars)

Line	Functional Category	Fiscal 1963	Fiscal 1964	Mean
1.	Education	0.38	0.51	0.45
2.	Health	11.94	13.26	12.60
3.	Sanitation	5.23	5.84	5.54
4.	Transportation	3.83	5.00	4.42
5.	Interest Payments	2.22	2.73	2.48
6.	General Expenditures	10.64	12.75	11.70
	(a) Municipal Assemblies	0.19	0.17	0.18
	(b) General Administration	8.76	10.50	9.63
	(c) Protection-Persons and Property	0.87	0.85	0.86
	(d) Land Conservation	0.57	0.64	0.61
	(e) Miscellaneous Public Works	0.25	0.59	0.42
7.	Total Expenditures	34.24	40.09	37.19

Note: Since care is taken to avoid double-counting the sources of funds spent by the municipalities include central government appropriations which are not included as expenditures of the latter. Moreover, the above fiscal year totals amount to a little less than half of total municipal expenditures due to the fact that they include only budgetary expenditures. The non-budgetary outlays are excluded because they consist principally of various types of expenses the functional purpose of which is known in their entirety at the municipal levels alone. The Bureau of Municipal Affairs in the Commonwealth Treasury Department does possess information on the functional purpose of the outlays of some of the 76 municipalities, but not on all; complete analysis would require investigation of the accounts of each municipality.

## TABLE A-20 completed

## Source:

Departamento de Hacienda de Puerto Rico, Administración de Asuntos Financieros, Negociado de Asuntos Municipales, Informe Anual del Negociado de Asuntos Municipales, fiscal years 1963 and 1964 (San Juan: 1963 and 1964), Table 18 in each publication. The figure for interest payments is from Ibid., 1963, p. 12 and Ibid., 1964, p. 13.





## General Expenditures

11. Assumption (1)	3.5	12.0	15.1	11.1	10.1	16.7	34.2	102.5
12. Assumption (2)	20.9	26.2	20.5	10.8	7.3	9.3	7.3	102.5
13. Assumption (3)	0.2	1.4	2.9	3.3	3.7	8.2	37.6	57.4
<hr/>								
Total Expenditures								
14. Assumption (1)	82.6	105.0	87.2	46.2	35.8	49.7	74.4	480.0
15. Excluding OASDI	73.4	79.5	71.9	37.0	30.8	44.8	71.3	407.8
16. Assumption (2)	100.0	119.2	92.6	45.9	33.0	42.3	47.5	480.0
17. Excluding OASDI	90.8	93.7	77.3	36.7	28.0	37.4	44.4	407.8
18. Assumption (3)	79.3	94.4	75.0	38.4	29.4	41.2	77.8	434.9
19. Excluding OASDI	70.1	68.9	59.7	29.2	24.4	36.3	74.7	362.7

## Sources:

- Line 1--Sum of Lines 1 of Table A-22 and Table A-23.  
 Line 2--Sum of Line 2 of Table A-22 and Lines 2 and 3 of Table A-23.  
 Lines 3 to 5 and 7 and 8--See Lines 3 to 5 and 7 and 8 of Table A-22.  
 Line 6--Sum of Line 6 of Table A-22 and Line 4 of Table A-23.  
 Line 9--Sum of Line 9 of Table A-22 and Line 5 of Table A-23.  
 Line 10--Sum of Lines 1-9.  
 Line 11--Sum of Line 11 of Table A-22 and Line 7 of Table A-23.  
 Line 12--Sum of Line 12 of Table A-22 and Line 8 of Table A-23.  
 Line 13--Sum of Line 13 of Table A-22 and Line 9 of Table A-23.  
 Lines 14, 16, and 18--Sum of Line 10 and Lines 11, 12, and 13 respectively.  
 Lines 15, 17, and 19--Lines 14, 16, and 18 less Line 8(b).

TABLE A-22

DISTRIBUTION OF CENTRAL GOVERNMENT EXPENDITURES, 1963  
(millions of dollars)

Line	Functional Category	Less than \$1,000	\$1,000-\$1,999	\$2,000-\$2,999	\$3,000-\$3,999	\$4,000-\$4,999	\$5,000-\$7,499	\$7,500 and over	Total
1.	Education	31.7	28.0	22.8	11.0	7.8	9.7	6.0	116.8
2.	Health	17.5	10.8	7.6	4.4	3.1	3.4	1.7	48.5
3.	Public Welfare	7.6	5.8	4.2	0.5	0.2	0.4	0	18.6
4.	Agriculture	2.5	5.6	3.8	2.1	1.3	1.8	1.7	18.6
5.	Labor Relations	0.1	0.5	0.7	0.6	0.5	0.9	1.3	4.6
6.	Transportation and Communication	0.4	1.5	2.7	3.1	2.9	6.2	12.1	28.9
7.	Housing	2.2	3.5	2.9	0	0	0	0	8.6
8.	Pensions and Social Security								
	(a) Commonwealth	2.3	7.7	8.7	1.9	3.2	3.3	10.1	37.1
	(b) OASDI Benefits	9.2	25.5	15.3	9.2	5.0	4.9	3.1	72.2

TABLE A-22 continued

Line	Functional Category	Less than \$1,000-								and over	Total
		\$1,000	\$1,999	\$2,999	\$3,999	\$4,999	\$5,000-	\$7,499	\$7,500		
9.	Interest Payments	0	0	0.1	0	0	0.1	0.6	0.9		
10.	Subtotal	73.5	88.9	68.8	32.8	24.0	30.7	36.6	354.8		
	General Expenditures										
11.	Assumption (1)	3.1	10.6	13.4	9.8	8.9	14.8	30.3	90.8		
12.	Assumption (2)	18.5	23.2	18.2	9.6	6.5	8.2	6.5	90.8		
13.	Assumption (3)	0.2	1.2	2.6	2.9	3.3	7.3	33.3	50.8		
	Total Expenditures										
14.	Assumption (1)	76.6	99.5	82.2	42.6	32.9	45.5	66.9	445.6		
15.	Excluding OASDI	67.4	74.0	66.9	33.4	27.9	40.6	63.8	373.4		
16.	Assumption (2)	92.0	112.1	87.0	42.4	30.5	38.9	43.1	445.6		
17.	Excluding OASDI	82.8	86.6	71.7	33.2	25.5	34.0	40.0	373.4		
18.	Assumption (3)	73.7	90.1	71.4	35.7	27.3	38.0	69.9	405.6		
19.	Excluding OASDI	64.5	64.6	56.1	26.5	22.3	33.1	66.8	333.4		

Note: Details may not sum to totals due to rounding.

TABLE A-22 continued

## Sources:

The following distributions by income classes of all Puerto Rican central government expenditures are achieved by distributing the totals of Table A-18 (net of the exported portion) on the basis of assumptions examined in depth in the text. These assumptions are only briefly mentioned here.

Line 1--It is assumed that 25 percent of total expenditures on education yields general benefits to the whole of Puerto Rican society and not merely to those who directly receive the benefits. Therefore, \$29.2 million is allocated by the distribution of the total number of families, Table A-1, Line 24. The remaining 75 percent is assumed to be incurred on behalf of the students enrolled in public institutions at all levels; \$64.28 million is allocated by a distribution of public school students in grades 4 through 12, Table A-1, Line 31; \$20.68 million spent on university education is allocated by a distribution of the family income levels of university students, Table A-1, Line 32; \$2.64 million spent on adult education is allocated by a distribution of total families in the three lowest income brackets (in ascending order of family income--30.9 percent, 38.8 percent, and 30.3 percent). The latter three totals--\$64.28 million, \$20.68 million, and \$2.64 million--comprise approximately 75 percent of their original totals since it is assumed that the 25 percent general benefits apply to all education expenditure components; this 75 percent correspondence is not exact because it is assumed that \$2 million of capital expenditures is made at the university level thus,  $\$20.68 = .75(24.9 + 2)$ ; the residual, \$66.92 million, is allocated between adult and non-adult education by analysis of the relative distribution of current outlays on the two items.

Line 2--Expenditures of \$48.5 million on health are broken down into numerous sub-categories for allocation purposes. Of total Health Department expenditures of \$33.01 million 40 percent, or \$13.24 million, is distributed by the total number of families, Table A-1, Line 24; 60 percent, or \$19.77 million, is allocated in

TABLE A-22 continued

proportion to the percentage distribution of the reciprocal of average broad income, Table A-1, Line 29. The \$7.67 million spent on the school lunch program is allocated by a distribution of public school students in grades 4 through 12, Table A-1, Line 31. One-eighth of total sanitation expenditures, or \$0.77 million, is allocated to the two lowest family income classes; the remainder, \$5.4 million, is allocated between the business and residential sectors in a 50-50 ratio: the business portion, \$1.7 million (\$1.0 million is exported), is distributed according to total consumption, while the residential portion, \$2.7 million, is allocated by a weighted distribution of owned, rented, and free dwellings (Table A-1, Lines 15 and 35 respectively). The \$2.7 million spent on hospital construction is allocated by the reciprocal of average broad income, Table A-1, Line 29.

Line 3--The entire total of expenditures on public welfare, \$18.6 million, is distributed by a series which includes cash benefits received through public assistance and private charity, Table A-1, Line 6.

Line 4--The total of \$18.6 million spent on agriculture is separated into two categories for distribution purposes. Administration and research expenses of \$5.67 million are distributed by the number of farm families, while outlays on marketing and production services and subsidies are allocated by a distribution of farm family income (Table A-1, Lines 33 and 34 respectively).

Line 5--Public expenditures of \$4.6 million on labor relations are distributed according to wages and salaries, Table A-1, Line 1.

Line 6--Total expenditures of \$28.9 million on transportation and communication are segregated into outlays on highways, other transportation, and communication. It is assumed that 25 percent of highway expenditures are incurred on behalf of non-highway users, and consequently \$7.41 million is allocated according to taxes paid on residential property, Table A-1, Line 12. The highway user share is distributed partially by auto operating expenditures (\$13.34 million) and partially by expenditures

TABLE A-22 continued

on transported goods--\$5.6 million (Table A-1, Lines 18 and 30 respectively). Other transportation expenditures are allocated half--\$0.5 million--by expenditure on air and other public transportation and half--\$0.5 million--by expenditures on transported goods (Table A-1, Lines 20 and 30 respectively). Communication outlays, \$1.53 million, are distributed according to expenditures on telephone and telegraph, Table A-1, Line 19.

Line 7--Housing expenditures of \$8.6 million are allocated according to a distribution of families (exclusive of unattached individuals) in the three lowest income brackets (in ascending order of family income--26.1 percent, 40.8 percent, and 33.1 percent).

Line 8--Total outlays of \$109.3 million on pensions and social insurance programs are divided into four categories. OASDI benefits are distributed according to social security receipts, Table A-1, Line 4; Commonwealth pensions and social insurance benefits of \$8.2 million are distributed by other government pensions and retirement benefits as are disability benefits of \$17.5 million (Table A-1, Line 8); unemployment insurance benefits of \$11.5 million are allocated by a series of the same title, Table A-1, Line 5.

Line 9--Total interest payments on the public debt assumed to accrue to residents--\$0.9 million--are distributed by an interest income series, Table A-1, Line 11.

Line 10--Sum of Lines 1-9.

Line 11--Assumption (1) postulates that the benefits from general expenditures accrue to families in proportion to their broad income; the total of \$90.8 million is consequently distributed according to broad income, Table A-1, Line 27.

Line 12--Assumption (2) postulates that the benefits from general expenditures accrue equally to all families; accordingly, the total of \$90.8 million is distributed by a percentage distribution of the total number of families, Table A-1, Line 24.

TABLE A-22 completed

Line 13--Assumption (3) postulates that the benefits from general expenditures accrue in proportion to investment income; the total of \$50.8 million (allowance is made for an exported share) is allocated by the distribution of investment income, Table A-1, Line 14.

Lines 14, 16, and 18--Sum of Line 10 and Lines 11, 12, and 13 respectively.

Lines 15, 17, and 19--Lines 14, 16, and 18 less Line 8(b).

TABLE A-23

DISTRIBUTION OF MUNICIPAL GOVERNMENT EXPENDITURES, 1963  
(millions of dollars)

Line	Functional Category	Less than \$1,000- \$2,000- \$3,000- \$4,000- \$5,000- \$7,500						
		\$1,000	\$1,999	\$2,999	\$3,999	\$4,999	\$7,499	and over Total
1.	Education	0.09	0.12	0.09	0.05	0.03	0.04	0.03 0.45
2.	Health	4.81	2.73	1.92	1.13	0.81	0.83	0.36 12.61
3.	Sanitation	0.54	0.97	0.88	0.52	0.39	0.56	0.63 4.51
4.	Transportation	0.05	0.19	0.35	0.43	0.39	0.84	1.68 3.93
5.	Interest Payments	0.01	0.04	0.07	0.06	0.05	0.12	0.88 1.24
6.	Subtotal	5.50	4.05	3.31	2.19	1.67	2.39	3.58 22.74
General Expenditures								
7.	Assumption (1)	0.40	1.37	1.73	1.26	1.15	1.91	3.91 11.7
8.	Assumption (2)	2.39	3.00	2.34	1.24	0.84	0.05	0.84 11.7
9.	Assumption (3)	0.03	0.15	0.34	0.38	0.44	0.94	4.32 6.6
Total Expenditures								
10.	Assumption (1)	5.90	5.42	5.04	3.45	2.82	4.30	7.49 34.4
11.	Assumption (2)	7.89	7.05	5.65	3.43	2.51	3.44	4.42 34.4
12.	Assumption (3)	5.53	4.20	3.65	2.57	2.11	3.33	7.90 29.3



TABLE A-23 continued

## Sources:

The following distributions by income classes of municipal government expenditures are achieved by distributing the totals of Table A-20 (net of the exported portion) on the basis of assumptions examined in depth in the text. These assumptions are briefly stated here.

- Line 1--It is assumed that the \$0.45 million the municipalities spend on educational activities benefits recipients on a per capita basis; consequently, the total is allocated by a distribution of the total number of families, Table A-1, Line 24.
- Line 2--40 percent of the expenditures on health, or \$5.04 million, is assumed to be available for public consumption in equal amounts, and is distributed by the total number of families, Table A-1, Line 24; the remaining 60 percent, or \$7.56 million, is assumed to benefit low income families, and is distributed according to the reciprocal of average broad income, Table A-1, Line 29.
- Line 3--Half of the expenditures on sanitation are assumed to be incurred on behalf of the residential sector, and \$2.77 million is distributed according to the weighted distribution of owned, rented, and free dwellings, Table A-1, Line 35. The latter half is assumed to be incurred on behalf of the business sector, and \$1.74 million (after deducting the exported share) is distributed according to total consumption, Table A-1, Line 15.
- Line 4--Total expenditures on transportation of \$3.93 million are divided into three parts. Twenty-five percent is assumed to be incurred on behalf of non-highway users, and \$1.11 million is distributed according to taxes paid on residential property, Table A-1, Line 12. The highway user share is allocated in a 60:40 proportion according to auto operating expenses--\$1.99 million--and to expenditures on transported goods--\$0.83 million after deducting the exported share (Table A-1, Lines 18 and 30 respectively).
- Line 5--Interest payments on the public debt assumed to accrue to residents--\$1.24 million--are distributed by an interest income series, Table A-1, Line 11.

## TABLE A-23 completed

Line 6--Sum of Lines 1-5.

Line 7--Assumption (1) postulates that families benefit from general expenditures in proportion to their income; thus, \$11.7 million is distributed by broad income, Table A-1, Line 27.

Line 8--Assumption (2) postulates that families benefit equally from general expenditures; thus, \$11.7 million is distributed according to the total number of families, Table A-1, Line 24.

Line 9--Assumption (3) postulates that benefits from general expenditures accrue in proportion to investment income; the total of \$6.6 million (after deducting the exported share) is distributed according to investment income, Table A-1, Line 14.

Line 10, 11, and 12--Sum of Line 6 and Lines 7, 8, and 9 respectively.

TABLE A-24

EFFECTIVE CENTRAL GOVERNMENT EXPENDITURE INCIDENCE, BY  
FUNCTIONAL CATEGORY AND FOR TOTAL EXPENDITURE STRUCTURE, 1963  
(broad income case)

Line	Functional Category	Less than \$1,000- \$2,000- \$3,000- \$4,000- \$5,000- \$7,500									
		\$1,000	\$1,999	\$2,999	\$3,999	\$4,999	\$7,499	\$7,499	and over	Total	Total
		Percentages									
1.	Education	41.6	10.9	7.0	4.6	3.6	2.7	0.8	5.3		
2.	Health	23.0	4.2	2.3	1.8	1.4	0.9	0.2	2.2		
3.	Public Welfare	10.0	2.3	1.3	0.2	0.1	0.1	0	0.8		
4.	Agriculture	3.3	2.2	1.2	0.9	0.6	0.5	0.2	0.8		
5.	Labor Relations	0.1	0.2	0.2	0.3	0.2	0.3	0.2	0.2		
6.	Transportation and Communication	0.5	0.6	0.8	1.3	1.3	1.7	1.6	1.3		
7.	Housing	2.9	1.4	0.9	0	0	0	0	0.4		
8.	Pensions and Social Security	3.0	3.0	2.7	0.8	1.5	0.9	1.4	1.7		
	(a) Commonwealth										
	(b) OASDI Benefits	12.1	9.9	4.7	3.9	2.3	1.4	0.4	3.3		
9.	Interest Payments	0	0	0	0	0	0	0.1	0		
10.	Subtotal	96.5	34.5	21.1	13.8	11.1	8.5	5.0	16.1		

General Expenditures										
11. Assumption (1)	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
12. Assumption (2)	24.3	9.0	5.6	4.0	3.0	2.3	0.9	4.1		
13. Assumption (3)	0.3	0.5	0.8	1.2	1.5	2.0	4.5	2.3		
Total Expenditures										
14. Assumption (1)	100.6	38.6	25.2	17.9	15.3	12.7	9.1	20.2		
15. Excluding OASDI	88.5	28.7	20.5	14.0	12.9	11.3	8.7	16.9		
16. Assumption (2)	120.8	43.5	26.6	17.8	14.2	10.8	5.8	20.2		
17. Excluding OASDI	108.7	33.6	22.0	13.9	11.8	9.5	5.4	16.9		
18. Assumption (3)	96.8	35.0	21.9	15.0	12.7	10.6	9.5	18.4		
19. Excluding OASDI	84.7	25.1	17.2	11.1	10.4	9.2	9.1	15.1		

Note: Details may not sum to totals due to rounding.

Source:

Each line of Table A-22 is expressed as a percentage of broad income, Table A-2, Line 8.

TABLE A-25  
EFFECTIVE MUNICIPAL GOVERNMENT EXPENDITURE INCIDENCE, BY  
FUNCTIONAL CATEGORY AND FOR TOTAL EXPENDITURE STRUCTURE, 1963  
(broad income base)

Line	Functional Category	Percentages									
		Less than \$1,000	\$1,000-\$1,999	\$2,000-\$2,999	\$3,000-\$3,999	\$4,000-\$4,999	\$5,000-\$7,500				
1.	Education	0.1	0	0	0	0	0	0	0	0	0
2.	Health	6.3	1.1	0.6	0.5	0.4	0.2	0.1	0.1	0.6	0.6
3.	Sanitation	0.7	0.4	0.3	0.2	0.2	0.2	0.1	0.1	0.2	0.2
4.	Transportation	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2
5.	Interest Payments	0	0	0	0	0	0	0	0.1	0.1	0.1
6.	Subtotal	7.2	1.6	1.0	0.9	0.8	0.7	0.5	1.1	1.1	1.1
General Expenditures											
7.	Assumption (1)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
8.	Assumption (2)	3.1	1.2	0.7	0.5	0.4	0.3	0.1	0.1	0.5	0.5

9. Assumption (3)	0	0.1	0.1	0.2	0.2	0.3	0.6	0.3
Total Expenditures								
10. Assumption (1)	7.7	2.1	1.5	1.4	1.3	1.2	1.0	1.6
11. Assumption (2)	10.4	2.7	1.7	1.4	1.2	1.0	0.6	1.6
12. Assumption (3)	7.3	1.6	1.1	1.1	1.0	0.9	1.1	1.4

Note: Details may not sum to totals due to rounding.

Source:

Each line of Table A-23 is expressed as a percentage of broad income, Table A-2, Line 8.



8. Total, Excluding OASDI Benefits and Federal Social Insurance Contributions	62.3	38.0	18.3	-4.2	-2.5	-18.8	-48.8	43.7
9. Total, Excluding OASDI Benefits	60.1	28.1	4.2	-15.1	-12.2	-31.1	-61.9	-28.6

Note: Details may not sum to totals due to rounding.

- aAssumption (1) distributes general expenditures proportional to broad income.
- bAssumption (2) distributes general expenditures proportional to the total number of families.
- cAssumption (3) distributes general expenditures proportional to investment income.

#### Sources:

- Lines 1, 4, and 7--Derived by subtracting the distribution of tax payments, Line 11 of Table A-4 from the distribution of government expenditures, Lines 14, 16, and 18 of Table A-21.
- Lines 2, 5, and 8--Derived by subtracting the distribution of tax payments exclusive of federal social insurance contributions, Line 15 of Table A-4 from the distribution of government expenditures exclusive of OASDI benefits, Lines 15, 17, and 19 of Table A-21.
- Lines 3, 6, and 9--Derived by subtracting the distribution of tax payments, Line 11 of Table A-4 from the distribution of government expenditures exclusive of OASDI benefits, Lines 15, 17, and 19 of Table A-21.



## APPENDIX B

In Chapter V mention was made of the fact that underlying the analysis of the income redistributive effects of the fiscal system is a budgetary deficit. The net gains experienced by the lower income classes cannot be entirely accounted for by the net losses suffered by the higher income groups; that is, the aggregate net gains are greater than the aggregate net losses. That portion of the net gains that does not consist of "transfers" from the upper income groups is traceable to the excess of public expenditures over public revenues. This study has distributed total expenditures of \$480.0 million (\$407.8 million if OASDI benefits are excluded) against total tax receipts of \$391.3 million (\$319.0 million if federal social insurance contributions are excluded), yielding an analytical budgetary deficit of \$88.7 million. Emphasis is placed on the word "analytical," for the resulting deficit based upon these figures is due to the methodological procedures followed.

Ordinarily a deficit arises due to a shortfall of total revenues in comparison to total expenditures in the course of the public sector's fiscal operations. This may be labeled an "official" deficit, and is one of the causal factors leading to the analytical deficit. Especially in the Puerto Rican case such a point merits further elaboration. Whereas the combined municipalities operated at a slight budgetary

surplus in 1963 the central government's total outlays exceeded its income exclusive of bond revenue; in fiscal 1963 total revenues less bond income amount to \$368.5 million and total appropriations sum to \$411.7 million; the corresponding fiscal 1964 data are \$418.9 million and \$449.2 million. Bond issues in fiscal 1963 and 1964 total \$60 million and \$50 million respectively.<sup>1</sup> However, such public security issues should not be regarded in an exactly analogous sense to those of the United States federal government. Commonwealth bond issues have the sole purpose of funding capital outlays and are not used to finance a budget deficit arising out of current expenditure overruns. Thus, in a sense, it is a misnomer to apply the label "deficit" to Puerto Rican fiscal operations, for there can really be no current deficit financing in insular financial administration. Not only is debt policy thereby restricted, but resort to any other policy would seriously erode Puerto Rico's entrée into mainland financial markets.

Under the present political arrangement Puerto Rico has no autonomy with respect to monetary policy, a fact which limits its debt management. It cannot issue coin and currency, and its money supply is automatically determined by market forces--the capital markets and the goods and services markets. Moreover, it "makes no effort to manipulate

commercial bank reserve requirements or in other ways to influence the volume of bank deposits. Consequently, it exercises no direct influence on the structure of interest rates in Puerto Rico."<sup>2</sup> The Government Development Bank, the government's fiscal agent, acts as a clearing house for intra-island checks and holds a non-member clearing account with the Federal Reserve Bank of New York; it does not, however, engage in open-market operations, nor does it possess the power to vary reserve requirements of Commonwealth chartered banks. It may therefore be concluded that it almost completely lacks the functions of a central bank. Thus, some of the traditional ways of financing a budget deficit are closed, although the government does of course sell its securities either to the private sector or to commercial banks--almost wholly in external markets. As Ingram notes the Commonwealth does circuitously affect the insular money supply by means of such sales. By borrowing more heavily in New York some portion of the "external funds" remains to support a larger volume of bank deposits, although the portion is relatively small.<sup>3</sup> As a corollary the budget is not employed as a conscious instrument of countercyclical policy, for which the burden falls on the federal government.<sup>4</sup>

The above remarks aside, the relevant point is that total expenditures exceed total revenue receipts net of

security income. The resulting "official" deficit then contributes to the existence of the analytical deficit, but two other factors also contribute significantly: the amount of taxes assumed exported is greater than the amount of expenditures assumed exported, and the total amount of revenues excluded from the calculations for theoretical purposes is greater than the amount of expenditures excluded under similar reasoning. In addition to those portions of the taxes appearing in Table 11 that are assumed exported there is one tax which is exported in its entirety, is not a Puerto Rican applied levy, and does not accordingly appear in the tax tables. Off-shore excise taxes are levies collected by the federal government on sales of Puerto Rican rum and tobacco in the United States, and are returned to the Commonwealth treasury. It may be argued that such returned excises are more in the nature of federal grants and therefore should be excluded from the study for the sake of consistency. However, such a course is not followed, for the off-shore excise proceeds flow into the Treasury Department's general fund, and it is thus impossible to trace the functional expenditure categories to which these dollars are assigned.<sup>5</sup>

Those revenues excluded from the tax totals are chiefly non-tax receipts. Income taxes withheld from non-residents are precluded because the tax burden borne by residents alone

is to be measured. Non-tax revenues derived from fines, the profits of government enterprises, the sales of goods and services, interest and dividends, and asset rentals are omitted either due to their commercial, non-tax nature or to the difficulty of allocating them among income classes. The expenditures eliminated because they cannot be reasonably allocated, of little absolute magnitude, comprehend certain already-mentioned transfer payments and municipal disbursements.

The existence of the analytical deficit means that the net fiscal amounts, the net fiscal schedules, or the absolute net gains in dollar terms are either higher or greater than they would be without the deficit--that is, than if tax revenue had closed the gap. Thus, the presence of the deficit affects not only the level of the net fiscal incidence pattern but also its distribution among income classes.<sup>6</sup>

In order to see what the net fiscal pattern would be like if the analytical budget deficit were eliminated--that is, to see the magnitude of income redistribution due to fiscal policy alone in a balanced budget setting--the deficit gap will be assumed to be removed. To do this additional taxes amounting to \$88.7 million are hypothesized to be collected and allocated according to the overall tax burden distribution, thereby altering both the level and the distribution

of the net fiscal incidence pattern.<sup>7</sup> Such a distributional assumption is admittedly fraught with theoretical pitfalls. In the first place, it may not be valid to assume that the extra taxes are distributed in this specific manner; secondly, it posits that the original broad income distribution is unaffected by the supplementary levies; thirdly, and most significantly, it postulates that it is possible to actually segregate those net benefits or net losses due to budgetary policy from those due to the existence of the deficit.

This third pitfall warrants further consideration. As Gillespie notes, an integration into the framework of the overall study of the deficit consequences "depends upon the theory of income determination that is assumed to underlie the entire analysis."<sup>8</sup> In a full employment context a budget deficit implies price inflation, leading by definition to a reduction in real incomes. Given the methodological assumption that taxes are subtractive and expenditures additive vis-à-vis income in such a full employment setting, the procedure previously followed in calculating net benefits or net burdens would overstate the net real benefit and understate the net real burden. In a less-than-full employment context, certainly more applicable to Puerto Rico's situation, inflationary pressures may not even be felt. Assuming the deficit creates employment for formerly unemployed factors of

production incomes rise by some multiple of the deficit, thereby implying a modified net fiscal incidence pattern.<sup>9</sup> Other models of income determination would lead to equally divergent conclusions regarding the distributive effects of the deficit, but no one of them can be considered better than the others for the purpose at hand.

On a slightly different tack, but in relation to the same problem, some expenditures are financed by non-residents through Puerto Rican receipts of funds from income taxes on non-residents and off-shore excises. The exclusion of both these revenue sources is a contributing factor to the analytical deficit, and since their burden falls on non-residents Puerto Rican families in the aggregate are enabled to experience a benefit to which there is no corresponding burden. Thus, resident family total expenditure benefits surpass total tax payments, but it is not empirically possible to distribute the "surplus" among family income classes. These remarks apply equally as well to that share of the deficit created by the excess of other exported taxes over exported expenditures.

The upshot of these comments is simple: elimination of the deficit requires measurement of the distributive implications of the deficit itself. But the lack of a uniquely suitable theory of income determination and of appropriate



methodological techniques renders the necessary empirical determination nearly impracticable. As a consequence, recourse is had to a concededly expedient measure: the assumption that the taxes collected to eliminate the deficit are distributed according to the distribution of the overall burden.

Table B-1 presents the effective rates of net fiscal incidence for the three alternative general expenditure assumptions based on the hypothetical elimination of the analytical budgetary deficit. When this table is analyzed in conjunction with Table 18, which includes the budget deficit effects, it becomes apparent that, as stated above, both the level and the distribution of the net fiscal incidence pattern are altered. Although the level is lower and the distribution is slightly different the general pattern of net fiscal incidence remains regressive across the entire income range. The only significant development is that the "break-even range" for all general expenditure assumptions occurs between \$2,500 and \$3,500, whereas prior to the deficit elimination it had occurred between \$3,500 and \$4,500 under Assumptions (1) and (2). Thus, it may be concluded that income redistribution within the Puerto Rican fiscal system is a reality even if analysis were carried out under conditions of budgetary balance. Figure B-1 allows for graphical support of the

TABLE B-1

EFFECTIVE NET FISCAL INCIDENCE WITH ELIMINATION OF THE  
ANALYTICAL BUDGETARY DEFICIT, 1963  
(broad income base)

Line	Item	Less than \$1,000	\$1,000- \$1,999	\$2,000- \$2,999	\$3,000- \$3,999	\$4,000- \$4,999	\$5,000- \$7,499	\$7,500 and over	Total
Percentages									
Assumption (1) <sup>a</sup>									
1.	Total, All Government Levels	92.0	21.4	5.8	-3.5	-4.2	-9.2	-12.6	0
2.	Total, Excluding OASDI Benefits and Federal Social Insurance Contributions	83.2	15.5	5.8	-2.4	-1.6	-7.2	-11.7	0
3.	Total, Excluding OASDI Benefits	82.7	14.4	4.3	-3.9	-3.4	-7.1	-9.6	0
Assumption (2) <sup>b</sup>									
4.	Total, All Government Levels	114.9	26.9	7.5	-3.6	-5.4	-11.2	-16.3	0
5.	Total, Excluding OASDI Benefits and Federal Social Insurance Contributions	106.1	21.0	7.5	-2.5	-2.9	-9.2	-15.4	0

6. Total, Excluding OASDI Benefits	105.6	19.9	6.0	-4.0	-4.7	-9.1	-13.3	0
Assumption (3) <sup>c</sup>								
7. Total, All Government Levels	89.4	19.0	4.1	-4.6	-5.2	-9.4	-10.0	0
8. Total, Excluding OASDI Benefits and Federal Social Insurance Contributions	80.3	13.1	3.9	-3.7	-2.9	-7.3	-8.9	0
9. Total, Excluding OASDI Benefits	79.8	12.1	2.5	-5.0	-4.4	-7.3	-7.0	0

<sup>a</sup>Assumption (1) distributes general expenditures proportional to broad income.

<sup>b</sup>Assumption (2) distributes general expenditures proportional to the total number of families.

<sup>c</sup>Assumption (3) distributes general expenditures proportional to investment income.

Source:

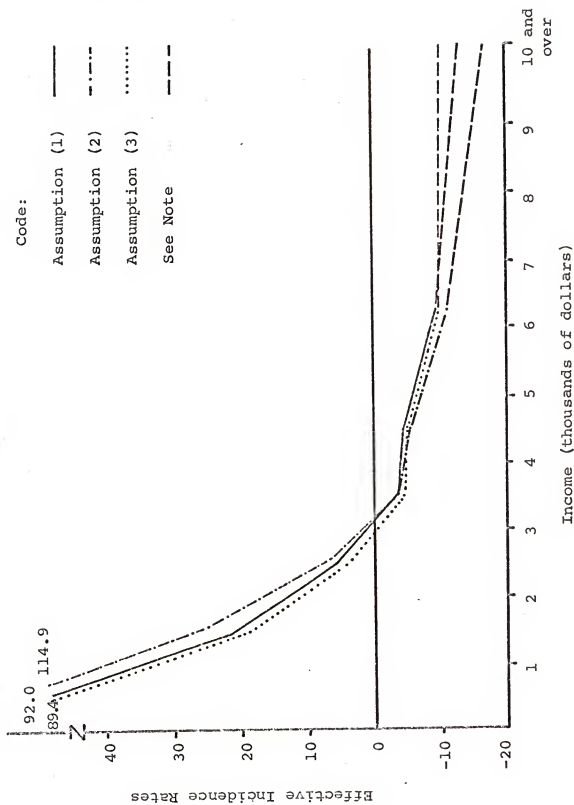
Each line of Table B-5 is expressed as a percentage of broad income, Table A-2, Line 8.

FIGURE B-1

EFFECTIVE NET FISCAL INCIDENCE FOR ALTERNATIVE GENERAL  
EXPENDITURE ASSUMPTIONS WITH ELIMINATION OF THE  
ANALYTICAL BUDGETARY DEFICIT, 1963  
(broad income base)

Note: Given that the effective rates within the highest family money income class are unknown each curve exhibits a dashed line after the mid-point of the "\$5,000-\$7,499" income class. The "trend" of the dashed portion of each line is upward if the effective rate is higher in this open-ended class than in the immediately preceding class, but is downward if the reverse is true.

Source: Table B-1.



above results; in comparison to Figure 7 it is readily appreciated that the "break-even point" under all general expenditure assumptions falls farther to the left--in the \$2,500-\$3,500 family income range--than in the previous deficit situation.

In terms of dollar magnitudes the redistribution of income with the hypothetical elimination of the budgetary deficit is presented in Table B-2. Again, this simply represents an alternative manner of presenting the same data, so that the basic conclusions are identical. It is observed that the income groups up to \$3,000 experience a net gain in income after redistribution under all general expenditure assumptions, whereas in Table 20 it is noted that income classes up to \$4,000 enjoy a net gain under Assumptions (1) and (2) inclusive of the deficit effects. Income after redistribution (Line 4) as a proportion of original broad income now ranges from a high of 215 percent in the lowest income bracket to a low of 84 percent in the highest income class; the "break-even points" fall within the \$2,500-\$3,500 range in all likelihood. Of course, with the deficit eliminated, the net gain of the three lower income classes equals the net loss of the four highest income groups. Table B-3 presents the income redistributive effects of public taxes and expenditures on the "average" family on the assumption

TABLE B-2

INCOME REDISTRIBUTION THROUGH THE OVERALL FISCAL STRUCTURE WITH  
ELIMINATION OF THE ANALYTICAL BUDGETARY DEFICIT, 1963  
(millions of dollars)

Line	Item	Less than					and over				
		\$1,000	\$1,999	\$2,999	\$3,999	\$4,999	\$5,000-	\$7,499	\$7,500	Total	
1.	Original Broad Income	76.2	257.6	326.6	238.5	215.5	359.3	737.3	2,209.2		
2.	Tax Payments, with Adjustments to Eliminate the Deficit: (a) For Assumptions (1) and (2)	12.4	50.0	68.1	54.3	44.8	82.7	167.6	480.0		
	(b) For Assumption (3)	11.2	45.3	61.7	49.2	40.7	74.9	151.8	434.9		
3.	Expenditure Benefits: (a) Assumption (1)	82.6	105.0	87.2	46.2	35.8	49.7	74.4	480.0		
	(b) Assumption (2)	100.0	119.2	92.6	45.9	33.0	42.3	47.5	480.0		
	(c) Assumption (3)	79.3	94.4	75.0	38.4	29.4	41.2	77.8	434.9		
4.	Income after Redistribution (a) Assumption (1)	146.4	312.6	345.7	230.4	206.5	326.3	644.1	2,209.2		
	Percent of Original Income	192.1	121.4	105.8	96.6	95.8	90.8	87.4	100		

(b) Assumption (2)	163.8	326.8	351.1	230.1	203.7	318.9	617.2	2,209.2
Percent of								
Original Income	215.0	126.9	107.5	96.5	94.5	88.8	83.7	100
(c) Assumption (3)	144.3	306.7	339.9	227.7	204.2	325.6	663.3	2,209.2
Percent of								
Original Income	189.4	119.1	104.1	95.5	94.8	90.6	90.0	100

## Source:

Line 1--Table A-2, Line 8.

Line 2(a)--To the totals found in Table A-4, Line 11, are added taxes amounting to \$88.7 million; this latter figure is distributed according to a percentage distribution of the total tax burden, Table A-4, Line 12.

Line 2(b)--To the totals found in Table A-4, Line 11, are added taxes amounting to \$43.6 million, which are allocated by a distribution of total tax payments, Table A-4, Line 12. The budget deficit under Assumption (3) differs from that under Assumptions (1) and (2) because a portion of general expenditures is assumed exported due to their allocation by investment income.

Lines 3(a), 3(b), and 3(c)--Table A-21, Lines 14, 16, and 18.

Line 4(a)--Line (1) minus Line 2(a) plus Line 3(a).

Line 4(b)--Line (1) minus Line 2(a) plus Line 3(b).

Line 4(c)--Line (1) minus Line 2(b) plus Line 3(c).





5. Net Income Change	738	452	190	-172	-297	-793	-2,661	0
6. Net Income Change as Proportion of Original Broad Income	99	23	6	-4	-5	-10	-13	0

<sup>a</sup> Assumptions (1) and (2) distribute general expenditures by broad income and the number of families respectively.

<sup>b</sup> Assumption (3) distributes general expenditures by investment income.

Sources:

Lines 1-4 are derived by dividing the totals in Table B-2 by the total number of families in each income bracket.

Line 5--Mean of Lines 4(a), (b), and (c) minus Line 1.

Line 6--Line 5 as a percentage of Line 1.

that the deficit effects are neutralized; accordingly, the average net gains are lower and the average net losses are greater (Line 5) than in the previous case in which a deficit existed.

The cumulative percentages of income after taxes and expenditures accruing to the total number of families arranged in quintiles are presented in Table B-4 below. With hypothetical elimination of the deficit the redistributive processes of the fiscal system cause income distribution to be slightly more equal than prior to deficit elimination (compare the cumulative shares offered in this table with those of Table 22); this would be expected to happen since the taxes "raised" to correct for the deficit are distributed in a progressive fashion among income classes. No Lorenz curves corresponding to the data of Table B-4 are plotted since those curves of Figure 8 already approximate extremely closely the results. As before--that is, inclusive of the deficit--the successive movements of the curves would be in the direction of greater equality of income distribution, and it is the expenditure structure which furnishes the main impulse.

TABLE B-4

DISTRIBUTION OF INCOME BY CUMULATIVE PERCENTAGES OF FAMILIES,  
WITH ANALYTICAL BUDGETARY DEFICIT ELIMINATION, 1963  
(Lorenz Curves)

Quintiles	Cumulative Percent of Families	Cumulative Shares of Total Income				
		Initial Broad Income	Income After Taxes <sup>a</sup>	Income After Taxes and Expenditures <sup>b</sup>		
				Assumption (1)	Assumption (2)	Assumption (3)
Lowest	20	3.3	3.6	6.5	7.3	6.4
Second	40	13.1	13.7	18.0	19.3	17.7
Third	60	27.2	27.8	33.0	34.6	32.5
Fourth	80	48.2	48.8	53.5	55.1	52.8
Highest <sup>c</sup>	100	100.0	100.0	100.0	100.0	100.0

<sup>a</sup>When the deficit is hypothetically eliminated the amount of taxes to be additionally "collected" differs according to general expenditure Assumptions (1) or (2) and (3). The cumulative distributions of income after taxes in the two cases differ hardly at all so that little is lost by combining both into one.

<sup>b</sup>Assumptions (1), (2), and (3) distribute general expenditures by broad income, total families, and investment income respectively.

<sup>c</sup>Income in this quintile is a residual calculation.

Source:

Computations are made from data in Tables 3 and B-2.

TABLE B-5

THE NET FISCAL DISTRIBUTION WITH ELIMINATION OF THE ANALYTICAL BUDGETARY  
DEFICIT, ALL LEVELS OF GOVERNMENT, ABSOLUTE AMOUNTS, 1963  
(millions of dollars)

Line	Item	Less than \$1,000	\$1,000- \$1,999	\$2,000- \$2,999	\$3,000- \$3,999	\$4,000- \$4,999	\$5,000- \$7,500 and over	Total
Assumption (1) <sup>a</sup>								
1.	Total, All Government Levels	70.1	55.0	19.1	-8.3	-9.0	-32.9	-93.2 0
2.	Total, Excluding OASDI Benefits and Federal Social Insurance Contributions	63.4	40.0	19.0	-5.7	-3.5	-25.7	-86.6 0
3.	Total, Excluding OASDI Benefits	63.0	37.0	14.1	-9.2	-7.3	-25.4	-71.1 0
Assumption (2) <sup>b</sup>								
4.	Total, All Government Levels	87.5	69.2	24.5	-8.5	-11.7	-40.4	-120.1 0
5.	Total, Excluding OASDI Benefits and Federal Social Insurance Contributions	80.8	54.2	24.4	-6.0	-6.3	-33.1	-113.5 0
6.	Total, Excluding OASDI Benefits	80.4	51.2	19.5	-9.5	-10.1	-32.8	-98.0 0

Assumption (3) <sup>c</sup>									
7. Total, All Government Levels	68.1	49.0	13.3	-10.9	-11.2	-33.6	-74.0	0	
8. Total, Excluding OASDI Benefits and Federal Social Insurance Contributions	61.2	33.8	12.6	-8.8	-6.2	-26.4	-65.7	0	
9. Total, Excluding OASDI Benefits	60.8	31.1	8.3	-11.9	-9.5	-26.2	-51.9	0	
10. Distribution of the Deficit	2.3	9.2	12.6	10.0	8.2	15.3	31.0	88.7	
11. Distribution of the Deficit, Excluding OASDI Benefits and Federal Social Insurance Contributions	2.2	8.6	11.5	9.3	7.5	15.4	34.4	88.8	
12. Distribution of the Deficit, Excluding OASDI Benefits	0.4	1.7	2.3	1.9	1.5	2.8	5.8	16.5	

Note: Details may not sum to totals due to rounding.

<sup>a</sup>Assumption (1) distributes general expenditures proportional to broad income.

<sup>b</sup>Assumption (2) distributes general expenditures proportional to the total number of families.

<sup>c</sup>Assumption (3) distributes general expenditures proportional to investment income.

TABLE B-5 completed

## Sources:

- Lines 1, 2, and 3--Derived by subtracting Lines 10, 11, and 12 of this table from Lines 1, 2, and 3 of Table A-26.
- Lines 4, 5, and 6--Derived by subtracting Lines 10, 11, and 12 of this table from Lines 4, 5, and 6 of Table A-26.
- Lines 7, 8, and 9--The analytical budget deficit under Assumption (3) differs from that under Assumptions (1) and (2) because it is assumed that a portion of general expenditures is exported due to their allocation by investment income. The total deficit for all government levels amounts to \$43.6 million; the deficit totals \$43.7 million if OASDI benefits and federal social insurance contributions are excluded; if OASDI benefits alone are omitted there arises an analytical budget surplus of \$28.6 million. Each of these totals is distributed in the same manner as are the totals in Lines 10, 11, and 12 of this table, and the results are subtracted from Line 7, 8, and 9 of Table A-26.
- Line 10--The total analytical deficit is distributed according to the percentage distribution of the total tax burden, Table A-4, Line 11.
- Line 11--This analytical deficit is distributed according to the percentage distribution of the total tax burden exclusive of federal social insurance contributions, Table A-4, Line 15.
- Line 12--This analytical deficit is distributed according to the percentage distribution of the total tax burden, Table A-4, Line 11.

## NOTES

1. Work sheets, Departamento de Hacienda, Oficina de Estudios Económicos y Financieros, dated October 26, 1970. The revenue totals include income from all sources, both tax and non-tax; included are federal grants and balance from the previous fiscal year.

2. Ingram, p. 114.

3. Ibid., pp. 116-117 and Chapter IV.

4. Although this has been the case in the past Puerto Rico is not unable to instigate such policy. As Baer observes Commonwealth authorities do have possible measures at hand which may be implemented to at least alleviate the effects of mainland economic fluctuations. The Economic Development Administration might increase efforts to promote the type of firm which is relatively stable over the cycle; Baer found that apparel firms evince greater stability than other textile mill firms, for example. Specific types of social overhead projects might be undertaken in periods of slack private sector activity. Reserve requirements, established by the Treasury Department, might be lowered in times of recession, or Treasury might even lend reserves and thereby exercise controls via the rediscount rate. See Werner Baer, The Puerto Rican Economy and United States Economic Fluctuations (Río Piedras: University of Puerto Rico, 1962), pp. 147-149.

5. It might be assumed that these revenues finance a proportionate share of each functional expenditure category excluding pension and social security transfers. This procedure is not followed, however. In contrast, federal grants flow into the Treasury's Special Funds-resources available only for specific uses. Expenditures are charged directly to these funds, and for this reason it is possible to separate out those expenditures financed by federal grants.



6. See note 7 below.

7. See Table A-4, Line 11, for the distributive series used. If the additional taxes assumed collected are distributed according to the distribution of income then the existence of the deficit alters only the level and not the distribution of the net fiscal incidence pattern; that is, the curves depicting net fiscal incidence in Figure B-1 would undergo a proportional downward shift.

8. Gillespie (Canada), p. 166.

9. Incomes increase by means of the multiplier effect. See John Maynard Keynes, The General Theory of Employment, Interest, and Money (New York: Harcourt, Brace, and World, Inc., 1936), Chapter 10.

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## BIOGRAPHICAL SKETCH

Arthur James Mann was born in Rochester, New York, on August 19, 1940. He attended primary and secondary schools in Rochester, North Carolina, France, and Georgia, and was graduated from Druid Hills High School in Atlanta, Georgia, in 1958. In 1962 he received the degree of Bachelor of Arts with a major in Economics from Duke University.

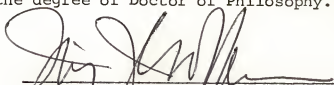
From 1962 to 1964 he served in the Peace Corps in the Dominican Republic. In 1965 he enrolled in the Graduate School of the University of Florida and studied under a Graduate School Fellowship, receiving the degree of Master of Arts with a major in Economics in December of 1965. He held the position of Instructor of Economics at the University of Puerto Rico in Mayagüez from 1966 to 1968. In January of 1969 he returned to the University of Florida to pursue work toward the degree of Doctor of Philosophy. After successfully completing the qualifying examinations in May, 1970, he spent the following ten months undertaking dissertation research in Puerto Rico.

Mr. Mann is presently on leave from the University of



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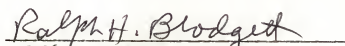
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Irving J. Goffman, Chairman  
Professor of Economics

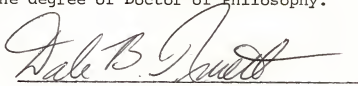
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Ralph H. Blodgett  
Professor of Economics

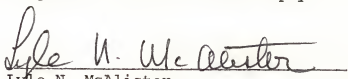
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Dale B. Truett  
Assistant Professor of Economics

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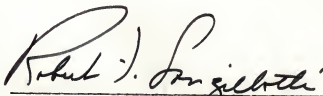


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Lyle N. McAlister  
Professor of History

This dissertation was submitted to the Dean of the College of Business Administration and to the Graduate Council, and was accepted as partial fulfillment of the requirements for the degree of Doctor of Philosophy.

August, 1971

A handwritten signature in dark ink, reading "Robert J. Longilotti". The signature is written in a cursive style with a large, looping initial "R".

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Dean, College of Business  
Administration

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Dean, Graduate School